



The Use of Marine Zoning to Balance Resource Protection with Utilization in a Multiple-Use Marine Protected Area

By
Billy D. Causey, Superintendent
Florida Keys National Marine Sanctuary

Massachusetts Ocean Management Workshop

Moakley Federal Courthouse
Boston, Massachusetts
July 30-31, 2003

Presentation Outline

- Touch on the NMSS
- Define MPAs
- NMSS - Act - Emphasizing Multiple-use
- FKNMS & Protection Act (1990)
- Description of natural/social environment
- Describe Uses in the FKNMS
- Touch on impacts to Sanctuary from uses
- Marine Zoning as a management tool
- Multiple-use marine zoning
- Summary of the concept

NOAA's National Marine Sanctuaries

designated ●



Definition of a Marine Protected Area:

Defined by the IUCN (The World Conservation Union) as:

"any area of intertidal or subtidal terrain, together with its overlying water and associated flora, fauna, historical and cultural features, which has been reserved by law or other effective means to protect part or all of the enclosed environment."

Reference: Guidelines for Establishing Marine Protected Areas
(Kelleher/Kenchington, 1991)

National Marine Sanctuaries are MPAs!!

- **Multiple-use program**
- **Recreational and commercial uses**
- **Primary objective is resource protection**
- **A challenging opportunity for managers**

In the *National Marine Sanctuary Act* (as amended in 2000) Congress found that:

- national marine sanctuaries managed as the

National Marine Sanctuary System **will -**

(A) improve the conservation, understanding, management, and wise and sustainable use of marine resources;

(B) enhance public awareness, understanding, and appreciation of the marine environment; and

(C) maintain for future generations the habitat, and the ecological services, of the natural assemblage of living resources that inhabit these areas.

National Marine Sanctuary Act
(as amended in 2000) Congress found
that among the “*Purposes and Policies*”
of the *Act* - Congress directed the
NMSS to:

**(6) to facilitate to the extent compatible with
the primary objective of resource protection,
all public and private uses of the resources of
these marine areas not prohibited pursuant
to other authorities;**

Florida Keys

“...This world of the Keys has no counterpart elsewhere in the United States, and indeed few Coasts of the earth are like it”

Rachel Carson

- 46 Bridges
- >1600 Keys
- >1800 miles of shoreline



There is as much social diversity



as biological diversity in the Florida Keys ...!!

In 1980's some Keys Residents Opposed



State Oversight as Area of Critical Concern

In the 1990's Some Keys Residents Opposed



A “Federal Takeover” of the Florida Keys!



**> 80,000
Residents in
Monroe
County**

(130,000 During Season)



Dredging and Filling Of Wetlands

Nearshore Water Quality Degradation



Stormwater Runoff

Second Largest Source of Nutrients





**3 Million Visitors
Annually**



(13.3 Million Visitor Days)



Tourism Based Economy

\$1.2 Billion US Annually



> 60 Dive Shops



> 65 Boat & PWC Rental Operations



> 35 Bait & Tackle Stores

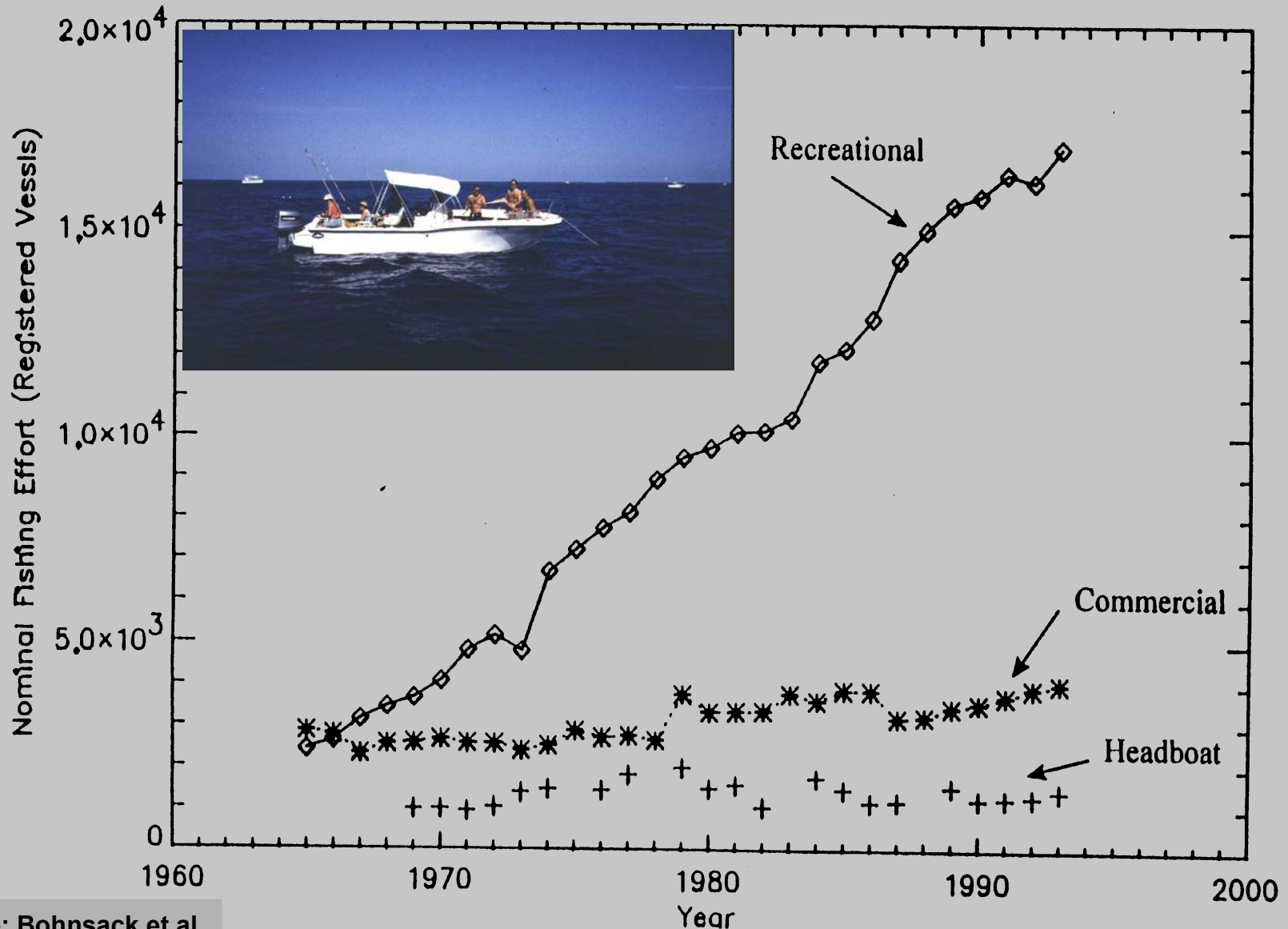
Snorkeling and SCUBA Diving # 1

User Activity



Trends in Boat Registration in the Florida Keys

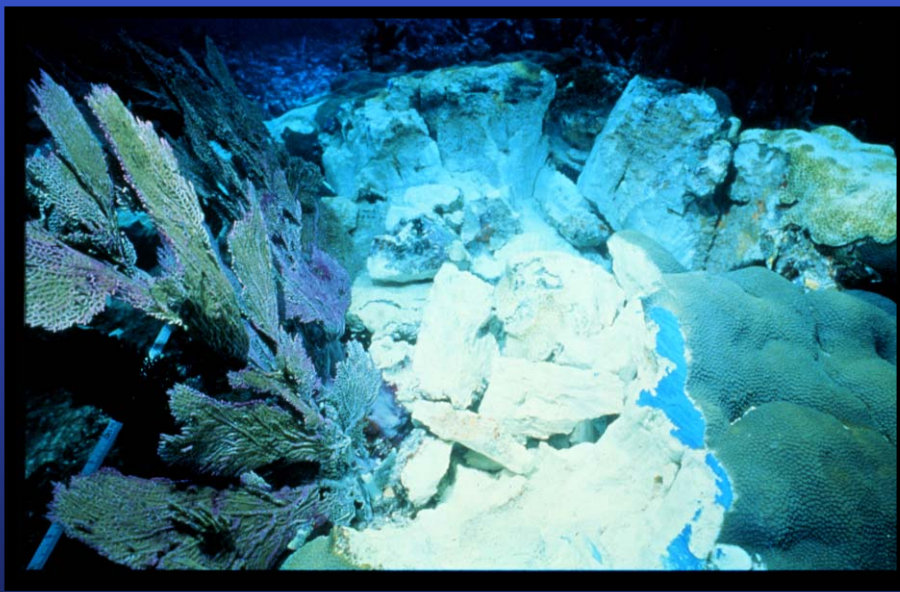
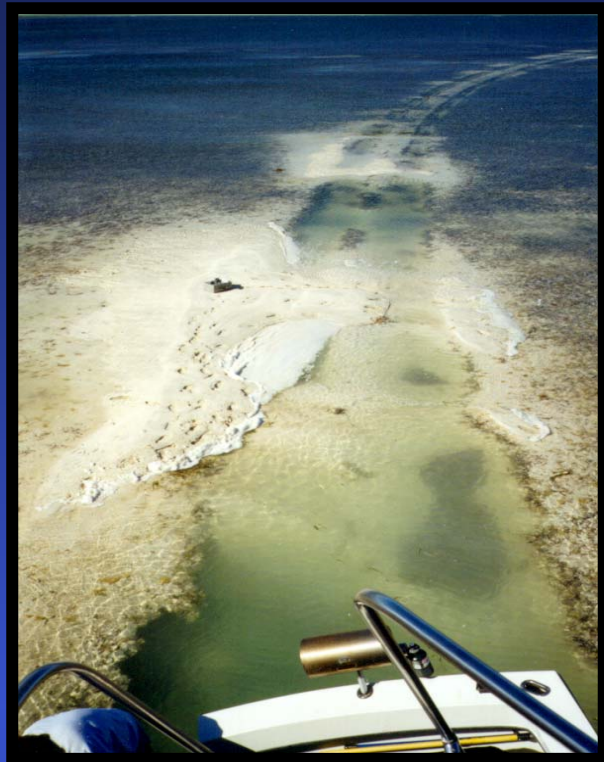
of Registered Vessels



Source: Bohnsack et al.

Over 600 Boat Groundings Each Year





Physical Impacts to the Resources



Commercial Fishing

Second Largest Industry

(\$70 Million US Landed Annually)



STATUS OF OCEAN HEALTH

Habitat Destruction



Coral Diseases



Pollution



Coral Bleaching



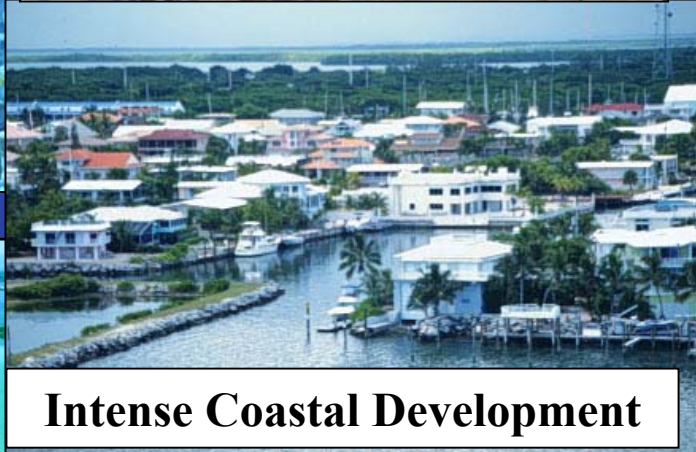
Overfishing



Massive Algal Blooms



Intense Coastal Development



Ocean Dumping

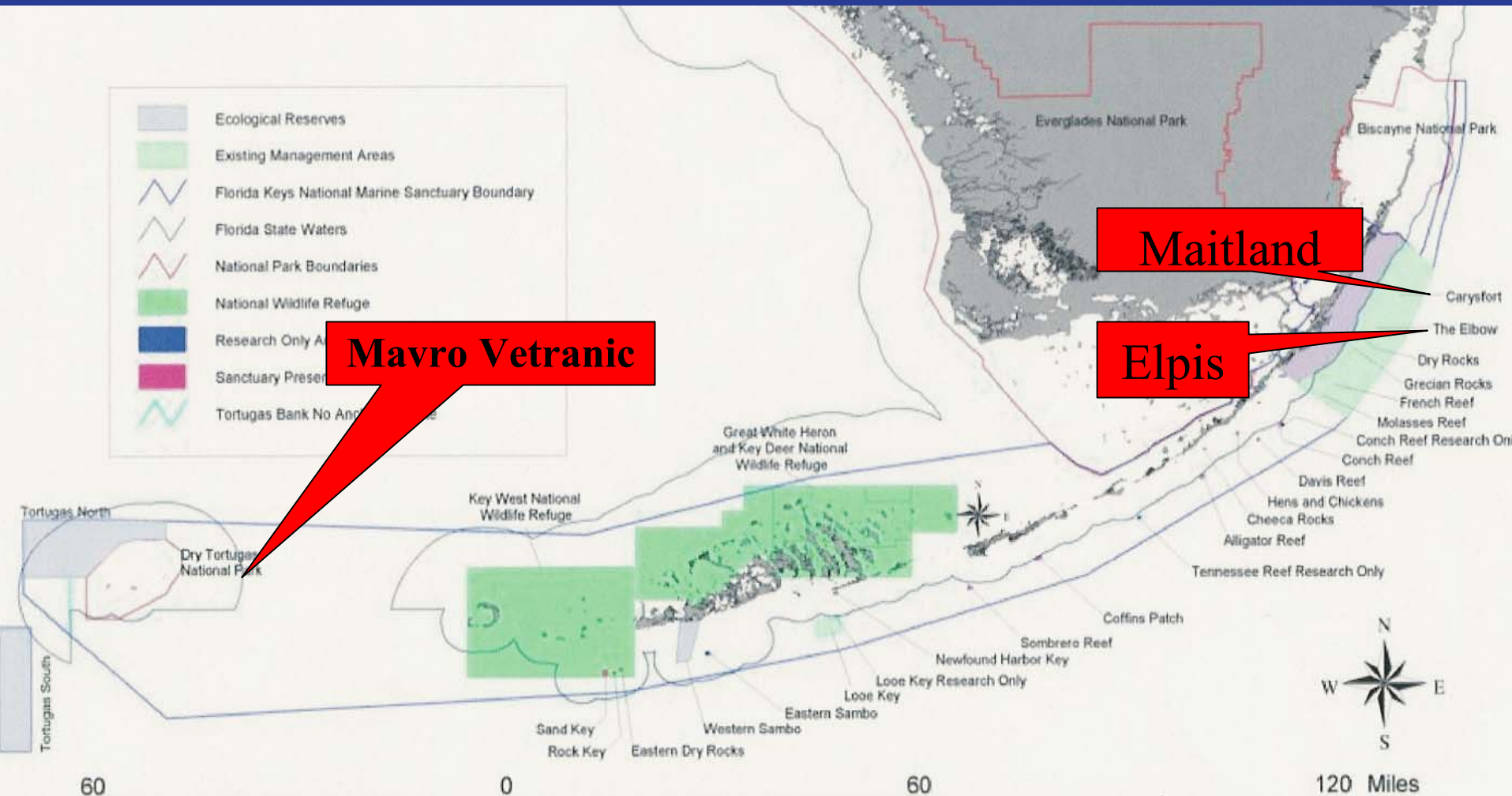


Introduction of Marine Exotics



Global Climate Change

Three Major Ship Groundings Prior to the 1990 Designation of the Florida Keys National Marine Sanctuary



SHIP GROUNDINGS

- Were more frequent
Prior to Designation
- 3 ship groundings in 17
Days - Oct-Nov 1989



M/V Alec Owen Maitland



M/V Mavro Vetranic



M/V Elpis

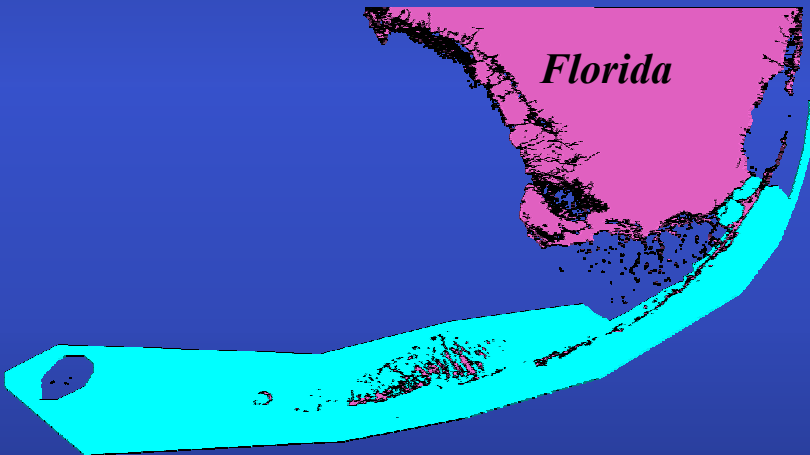
Florida Keys National Marine Sanctuary and Protection Act - 1990

(Passed By United States Congress)

- **Immediate protections offered**
 - Area To Be Avoided for ships >50 m designated
 - Oil and mineral exploration prohibited
 - Water Quality Protection Program established
- **NOAA Charged with developing a management plan that should “Consider temporal and geographic zoning...”**

Florida Keys National Marine Sanctuary and Protection Act - 1990

(Passed By United States Congress)



- 2800 nm² / now 2900 nm²
- Jurisdiction to mean high tide
- Surrounds Florida Keys
- Co-trustee Management with State of Florida
- 60% State Waters
- 40% Federal Waters
- 1600 Keys / 1800 miles of shoreline

Interagency Management Partnerships



Ecosystem Approach



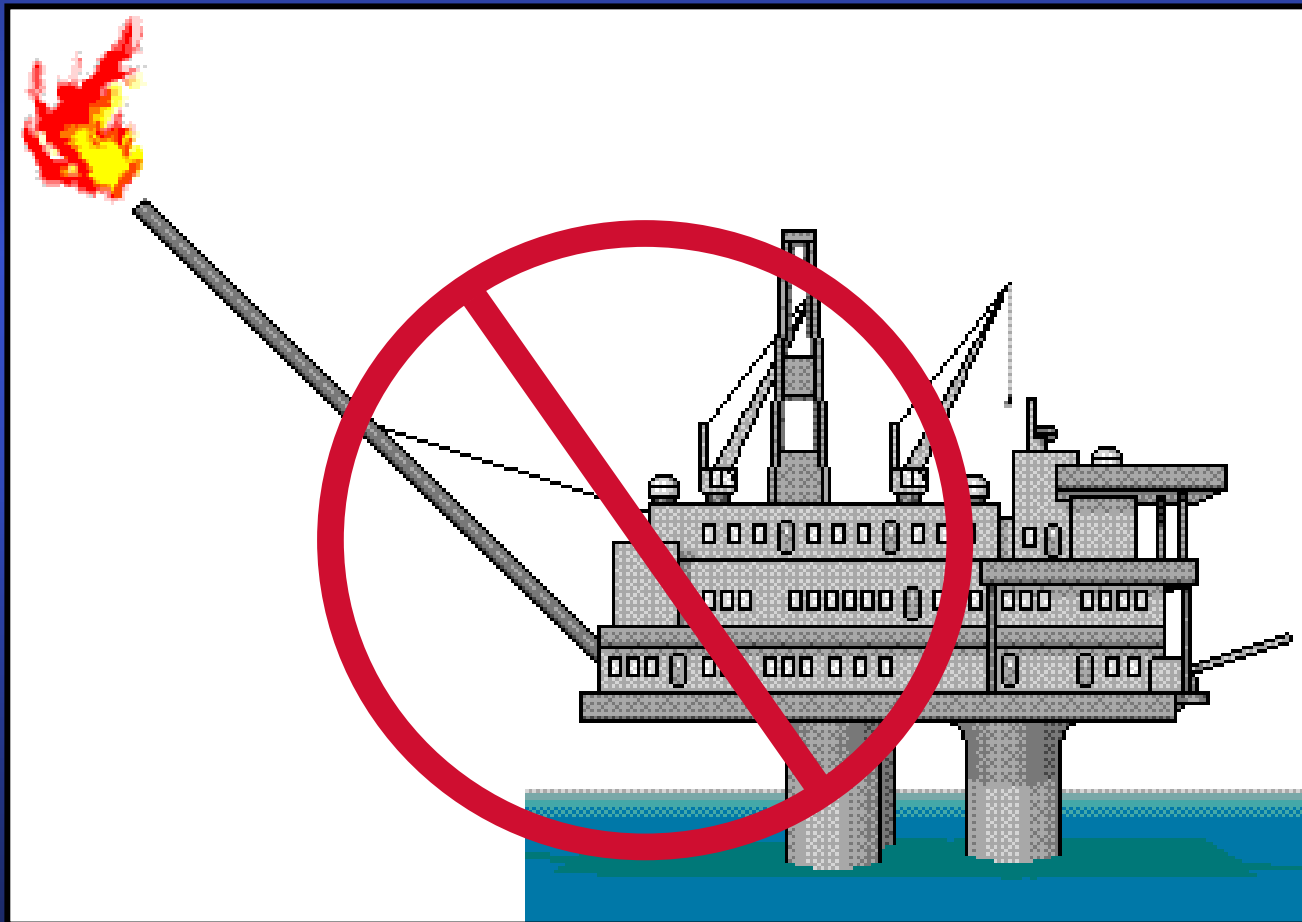
Includes the Full Seascape

Full-Range of Habitats

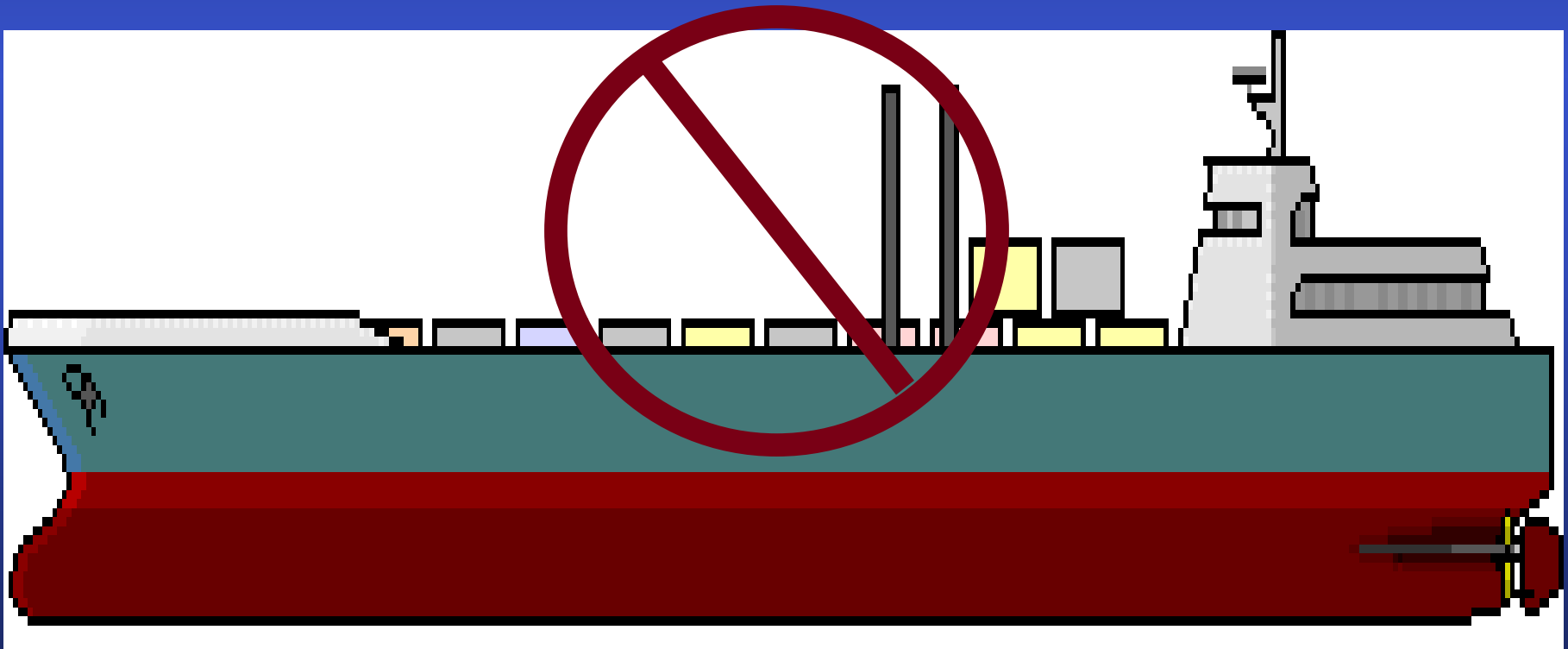


And All of the Marinelife

The FKNMS and Protection Act of 1990 placed a permanent ban on gas, oil, and hard mineral mining within the Sanctuary.



The FKNMS and Protection Act of 1990 prohibits ships greater than 50 meters (164 feet) from entering an “Area To Be Avoided” within Sanctuary boundaries

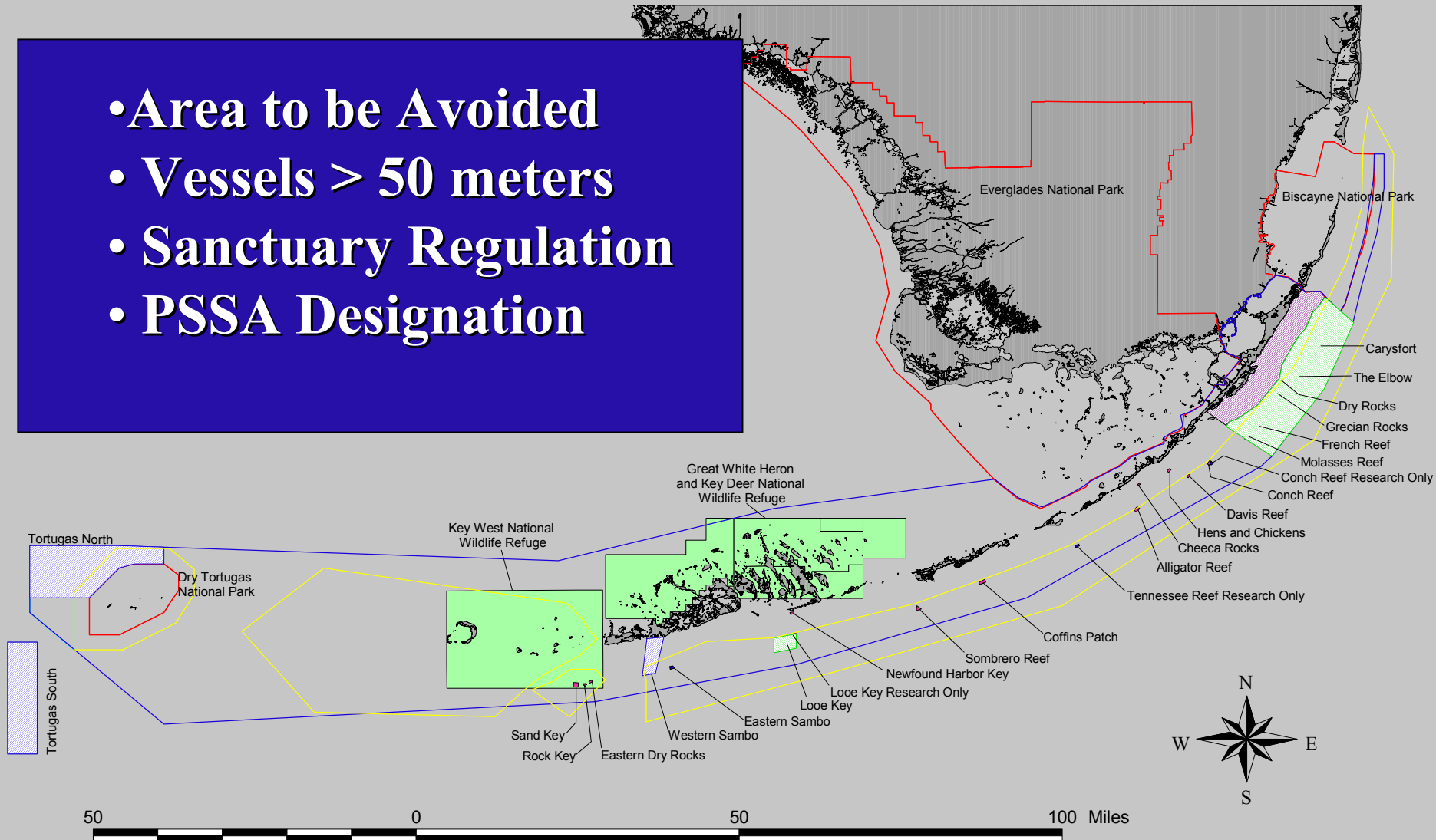


Area to be Avoided (ATBA)

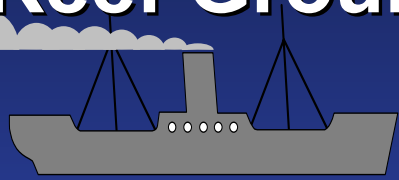
- **A type of marine zone to protect resources**
- **Establishes areas where ships cannot enter**
- **Does not impede shipping traffic any more than necessary**
- **Reduces the risk of ships from running aground on the coral reefs in the Keys**

International Maritime Organization Designated ATBA

- Area to be Avoided
- Vessels > 50 meters
- Sanctuary Regulation
- PSSA Designation



Reef Groundings Of Ships Over 50 m In Length



Wellwood
402'

Reefer
Merchant
300'

In God We
Trust
243'

Mavro
Vetranic
475'

Elpis
470'

Five
in a
5 year
period

One in a
6 year
period

8/84

5/85

12/86

10/89

11/89

11/90

Igloo Moon 465'

Houston
640'

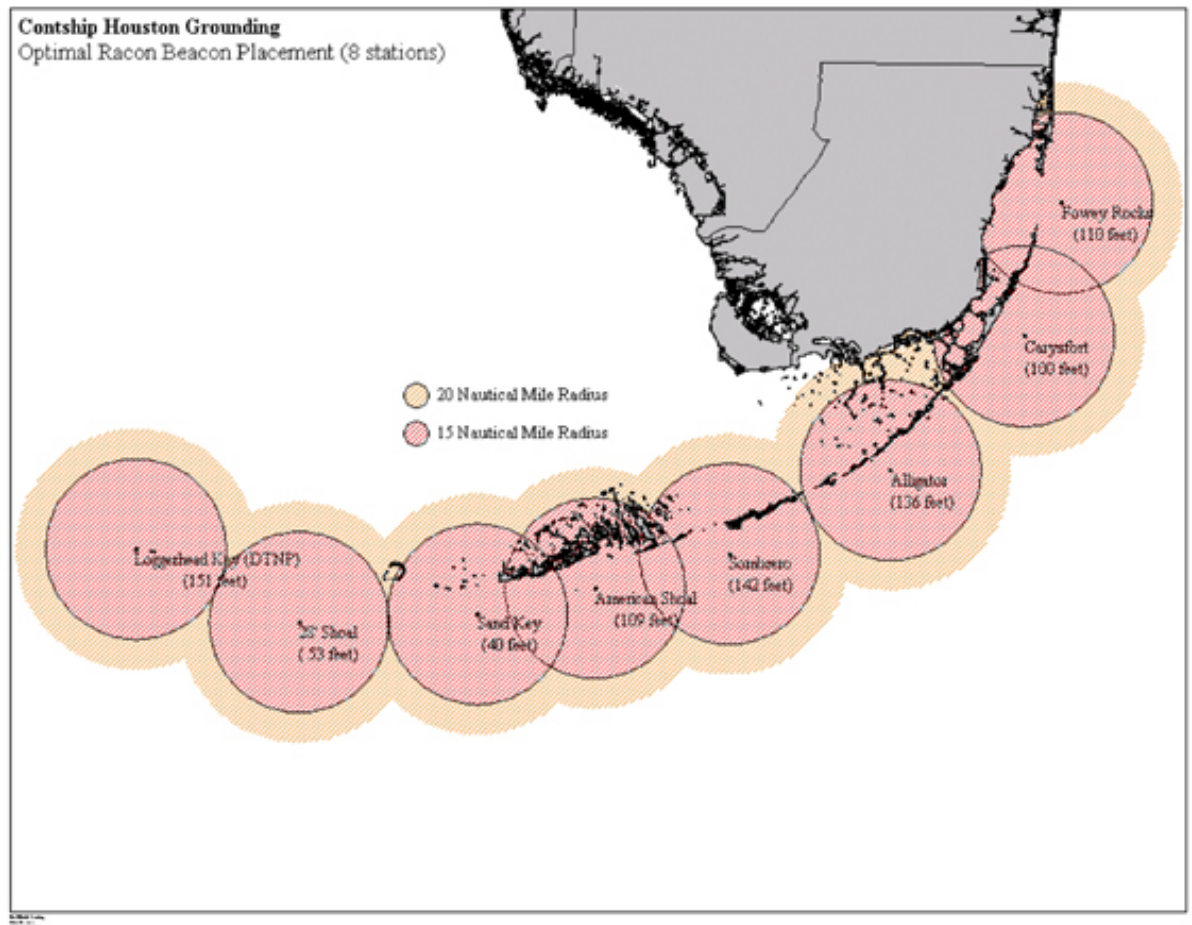
11/96

2/97

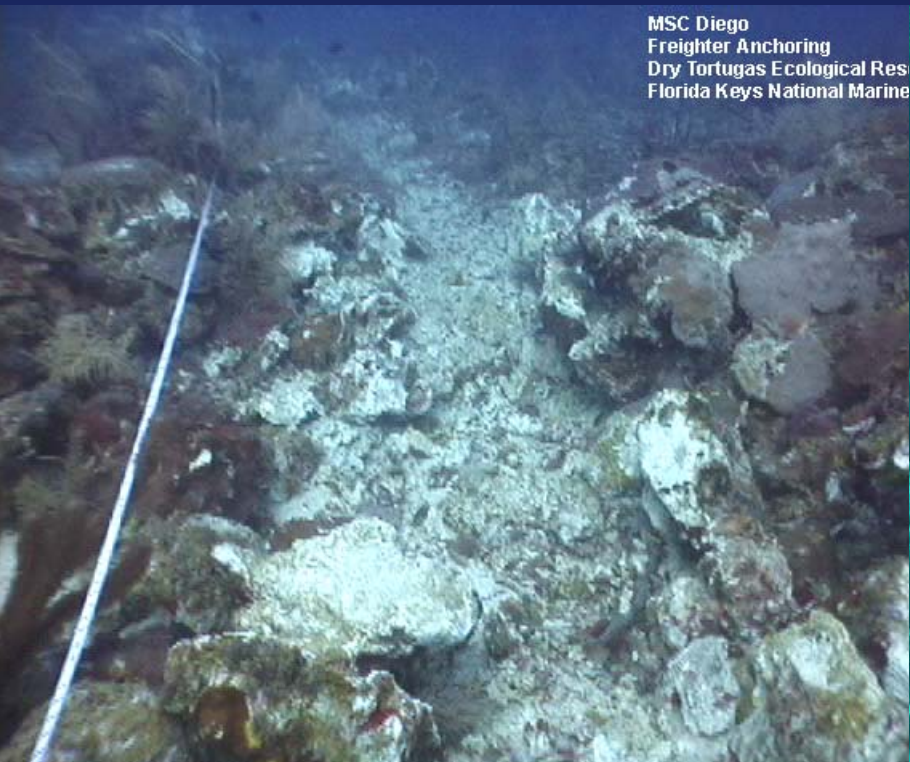
FKNMS Designated

8 RACON Beacons Placed Along Reef Tract

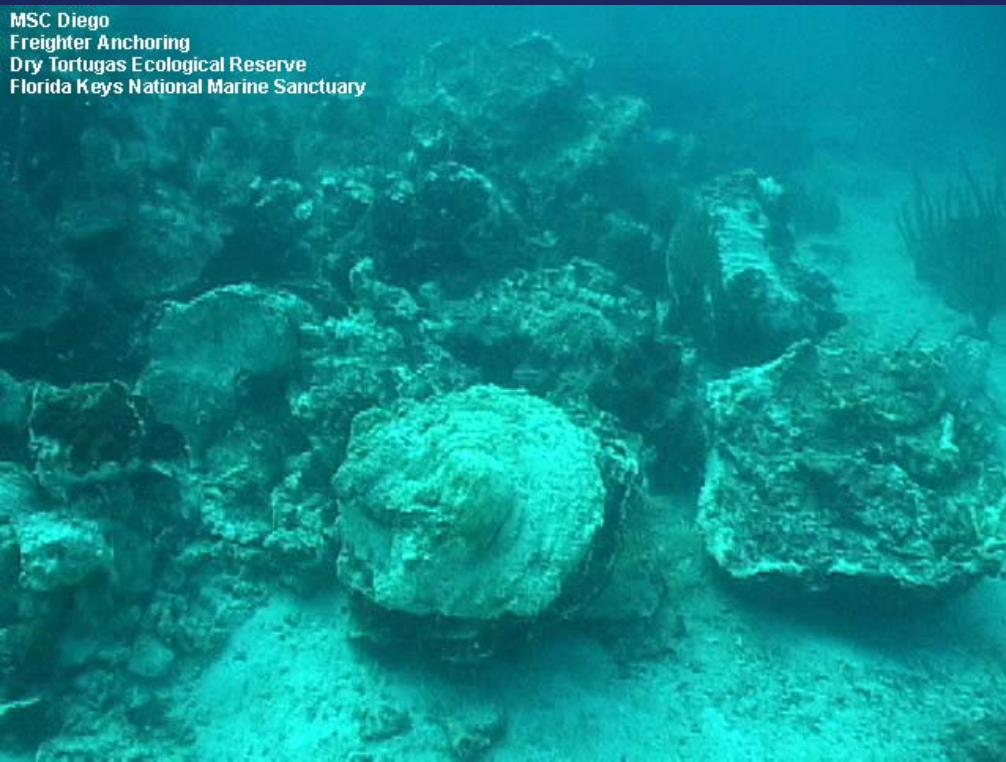
- Warn Ships on Radar Screen
- 20 mile range







MSC Diego
Freighter Anchoring
Dry Tortugas Ecological Reserve
Florida Keys National Marine Sanctuary



MSC Diego
Freighter Anchoring
Dry Tortugas Ecological Reserve
Florida Keys National Marine Sanctuary



MSC Diego
Freighter Anchoring
Dry Tortugas Ecological Reserve
Florida Keys National Marine Sanctuary



MSC Diego
Freighter Anchoring
Dry Tortugas Ecological Reserve
Florida Keys National Marine Sanctuary

No Discharge Zone in all State Waters



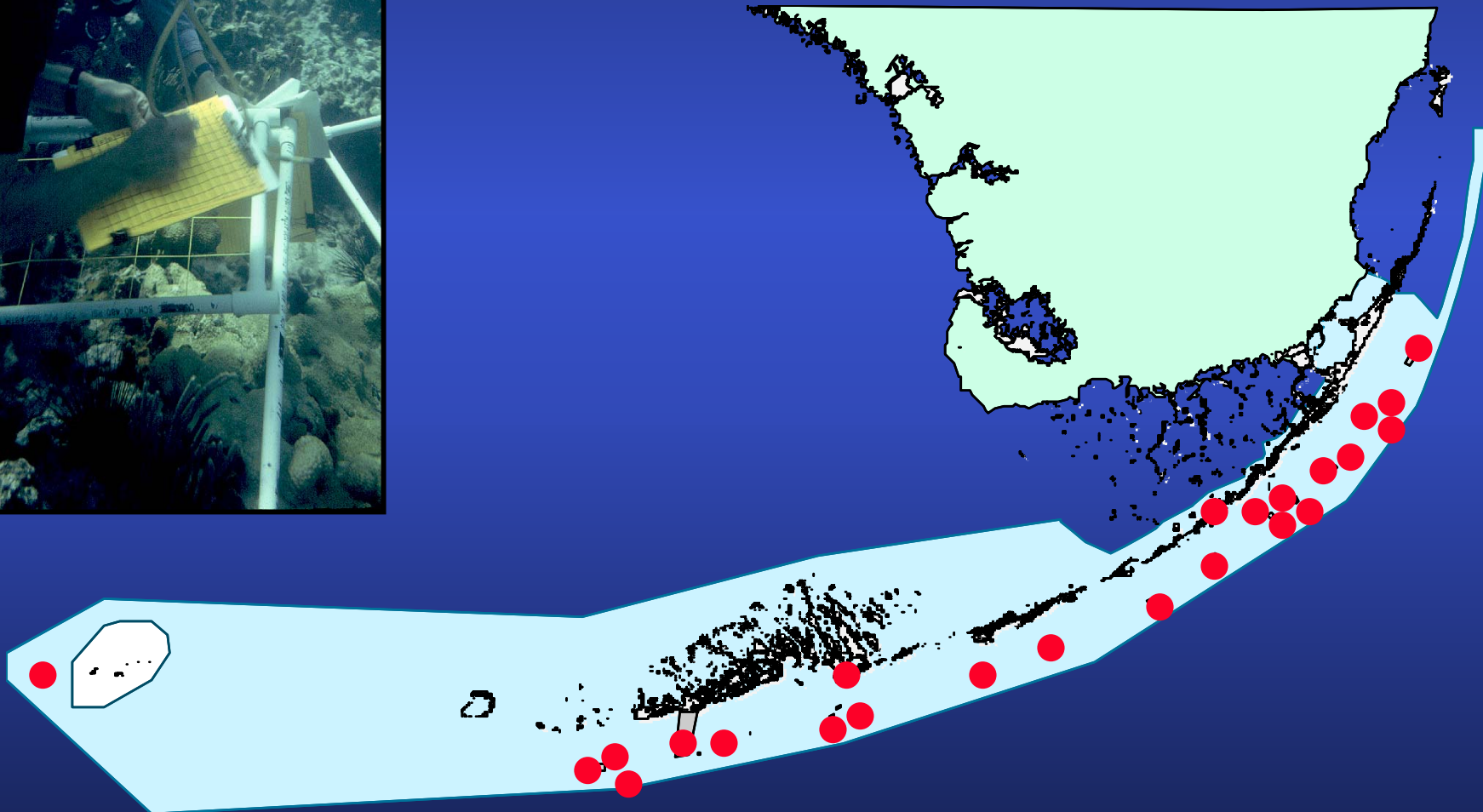
Sanctuary Management Programs

- Research and Monitoring
- Education and Outreach
- Volunteers
- Enforcement
- Threat Reduction Measures
- Marine Zoning



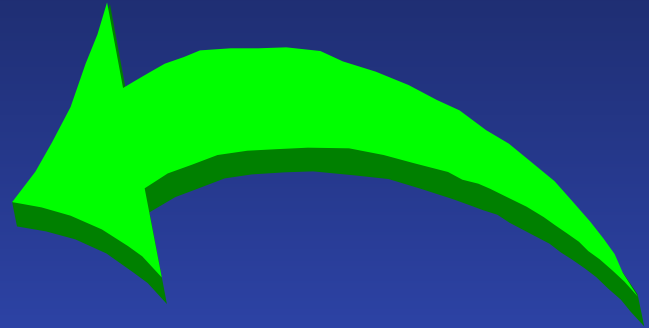
Research and Monitoring

- Essential to Management
- Science Guides Management

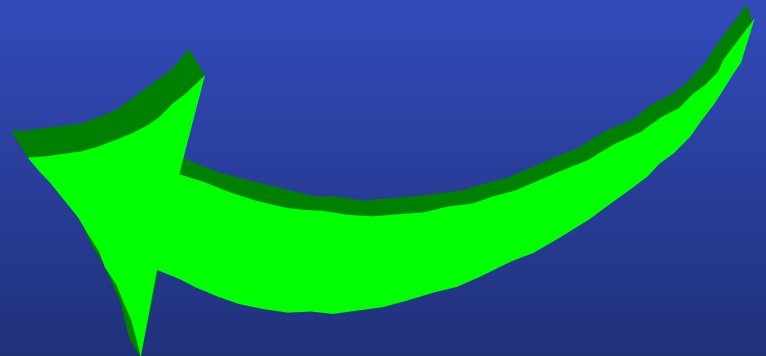


A tool for:

- **managing resources**
- **reaching people who impact those resources**



**Education
and
Outreach**



Team Ocean Conservation Education Action Network



Staff and Volunteers

Sanctuary Law Enforcement

- Sanctuary Enforcement is a Partnership Between NOAA and the State of Florida
- The Florida Fish and Wildlife Conservation Commission and NOAA entered into Memorandum of Agreement



Mooring Buoys

- Maintain > 400 Buoys
- Protects Reef from Anchors
- Can Manage Reef Access



Sanctuary Regulations

[Divided into two categories of regulations]

- Sanctuary Wide Regulations
- Sanctuary Regulations by Marine Zones

Florida Keys National Marine Sanctuary and Protection Act - 1990

(Passed By United States Congress)

- NOAA Charged with developing a management plan that should
“Consider temporal and geographic zoning...”

What is Marine Zoning?

“Zoning is the setting aside of areas for specific activities to balance commercial and recreational interests with the need for a sustainable ecosystem.”

FKNMS Final Management Plan, 1996

Marine Zoning



- **Versatile Management Tool**
- **GBRMPA - were pioneers in the concept of marine zoning**
- **Multiple-use management tool**
- **Protects and Conserves Marine Resources**
- **Reduces Conflicts**
- **To Implement Requires Collaboration & Leadership**

FKNMS Marine Zoning Goals

- **Protect areas representing a wide variety of habitats and that maintain ecosystem function**
- **Ensure areas of high ecological importance evolve naturally**
- **Preserve biodiversity and ecosystem integrity**
- **Protect nationally significant coral reef resources**
- **Protect and preserve sensitive areas**
- **Facilitate use activities compatible with resource protection**
- **Reduce user conflicts**

FKNMS Marine Zoning Objectives

- **Protect contiguous, diverse habitats**
- **Protect areas experiencing habitat declines**
- **Eliminate injury to sensitive areas**
- **Reduce stresses on sensitive wildlife populations by restricting access**
- **Provide undisturbed monitoring sites and control areas for research**
- **Disperse heavy concentrations of uses**
- **Minimize adverse socioeconomic impacts**

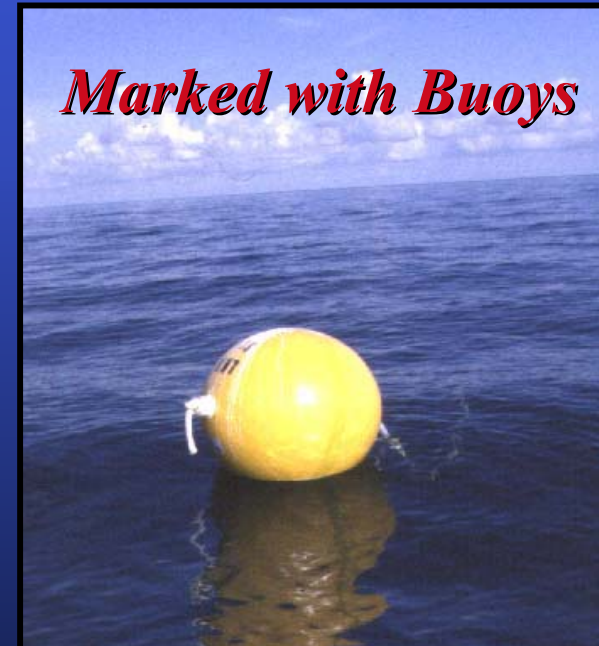
FKNMS Marine Zone Types

- Sanctuary Preservation Areas - 18
- Special Use (Research-only) Areas - 4
- Ecological Reserves - 2



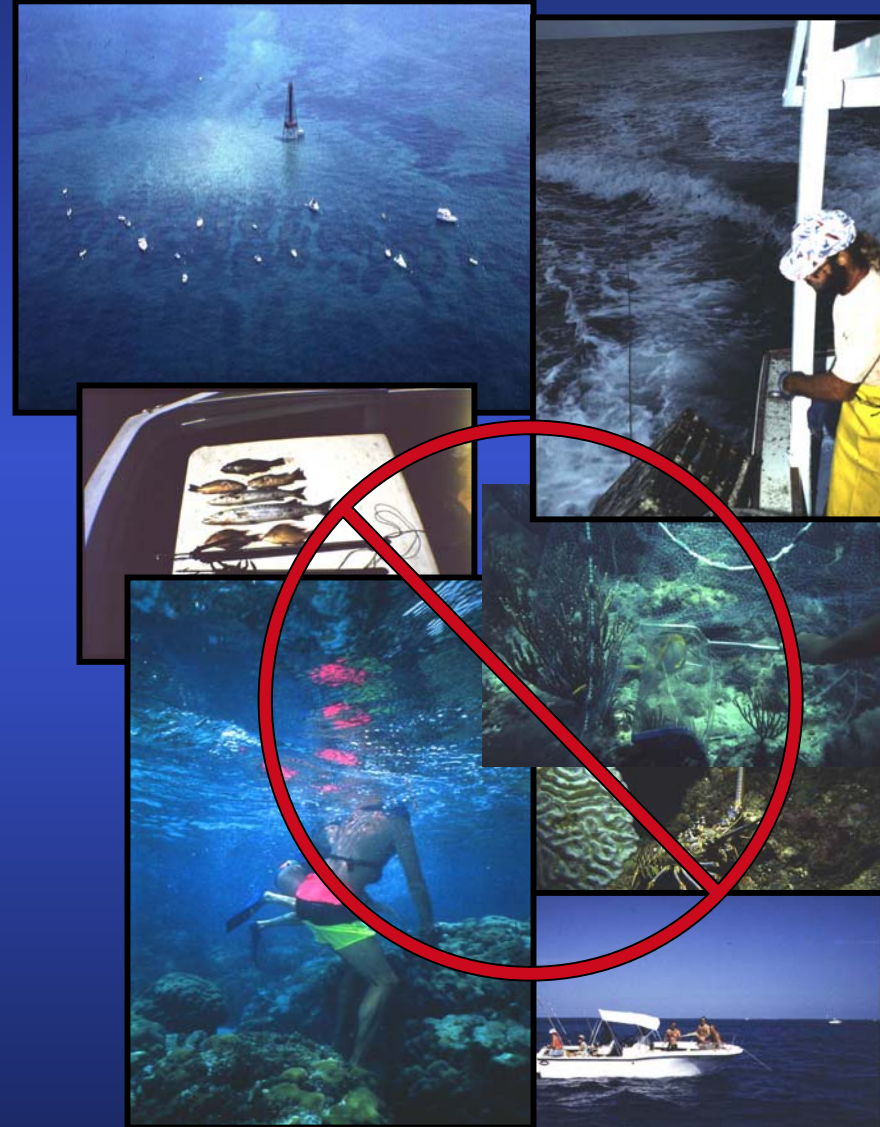
- Wildlife Management Areas - 27
- Existing Management Areas - 19
(6 federal, 13 state)

Marked with Buoys



Sanctuary Preservation Areas

- 18 SPAs (No-Take Areas)
- Shallow, heavily used reefs
- Areas of user conflicts
- Concentrated visitor activity leads to resource degradation
- Vary in size, water quality, and biodiversity
- Can sustain and protect habitat
- Enhance reproductive capabilities of renewable resources
- Areas that are critical for sustaining and protecting important marine species
- Reduce user conflicts in high-use areas



Looe Key Reef

80,000 - 85,000 snorkelers/divers



SPAs

- Focused protection
- More for Less
- Make-up 60-65% of Spur and Groove coral reef habitat
- SPAs Capture 80-85% of annual snorkeling and SCUBA diving
(except first 2 weeks of lobster season)
- Protect many species that do not move far

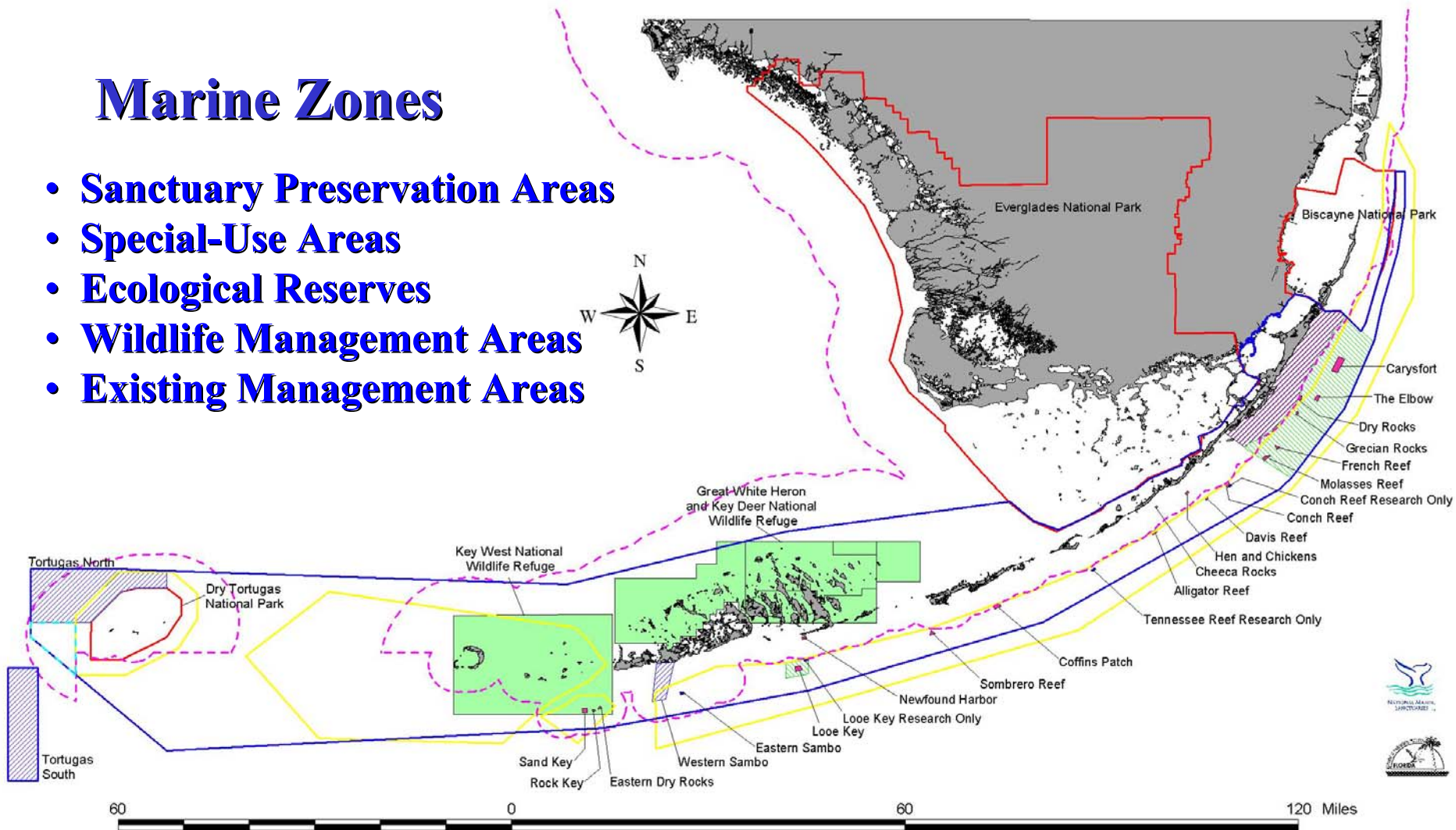
Sanctuary Preservation Areas

- **Prohibit all extractive or removal of resources**
- **Require use of mooring buoys when available**
- **No contact with corals or hardbottom**
- **Allow catch and release, trolling in 4 SPAs**
- **Allow permitted cast netting for Ballyhoo**

Florida Keys National Marine Sanctuary

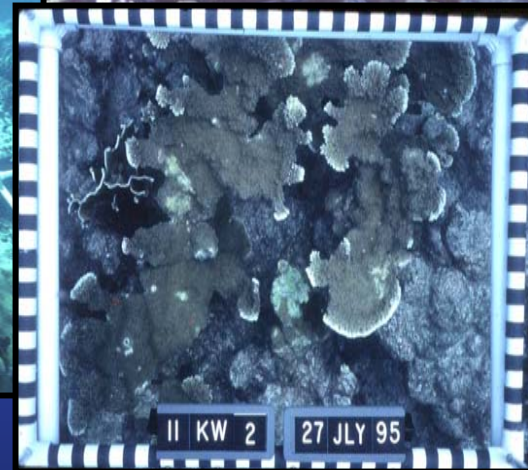
Marine Zones

- **Sanctuary Preservation Areas**
- **Special-Use Areas**
- **Ecological Reserves**
- **Wildlife Management Areas**
- **Existing Management Areas**



Special Use - Research Only Areas

- 4 Research Only Areas
- Variety of coral reef habitats
- Areas used for:
 - scientific research
 - educational purposes
 - restoration
 - monitoring
- High-impact activities prohibited
- Impacts minimized on sensitive habitats and reduce user conflicts
- Only Permitted Entry Allowed

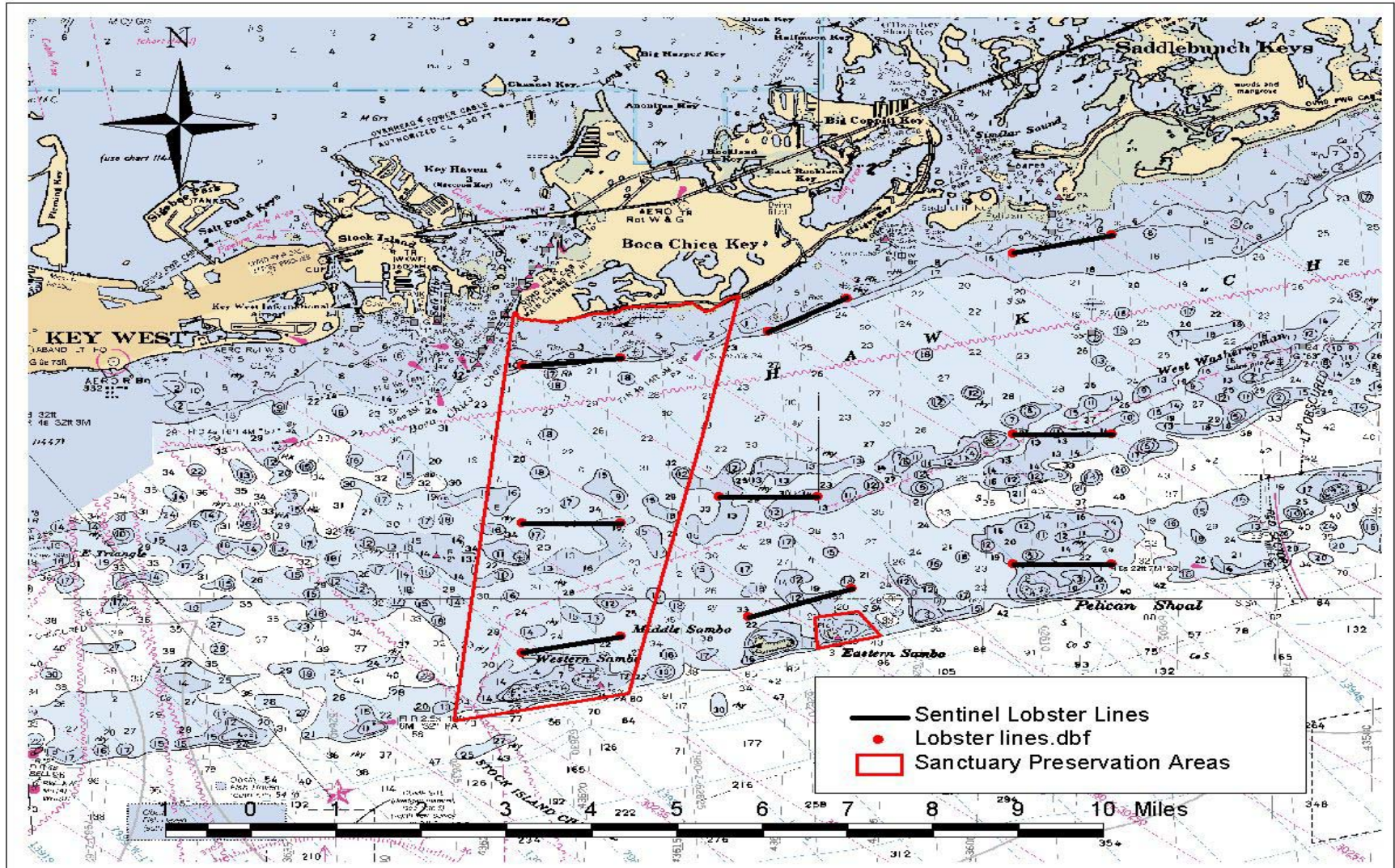


Ecological Reserves

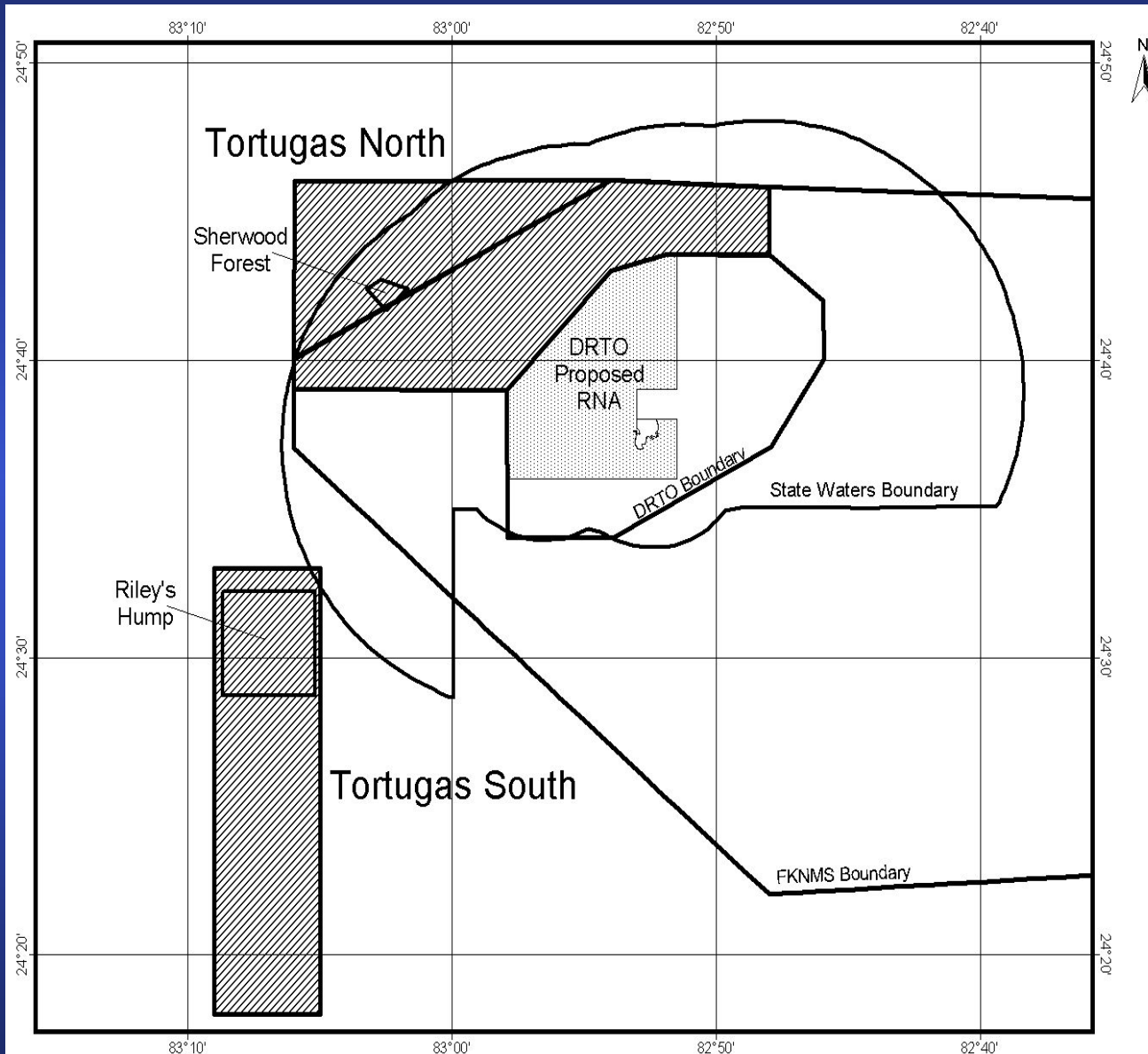
- 2 Areas - 9 snm and 151 snm
- Areas of high habitat and species diversity
- Representative Keys marine ecosystem
- Generally good water quality
- Encompass large enough areas to include a range of habitats
- Provide natural spawning, nursery, and permanent residence areas for the replenishment and genetic protection of marine life
- Protect and preserve all habitats and species particularly those not protected by fishery management regulations.



Western Sambo Ecological Reserve - 9 snm



Tortugas Ecological Reserve



Final

- July 1, 2001
- 518 sq k
- 151 sq mi
- Tortugas N & S
- FKNMS (boundary expanded)
- 7 Separate Jurisdictions

Tortugas Ecological Reserve

24°45' N



0 2 Miles

24°30' N



83° 45' W

82° 45' W



Sherwood Forest



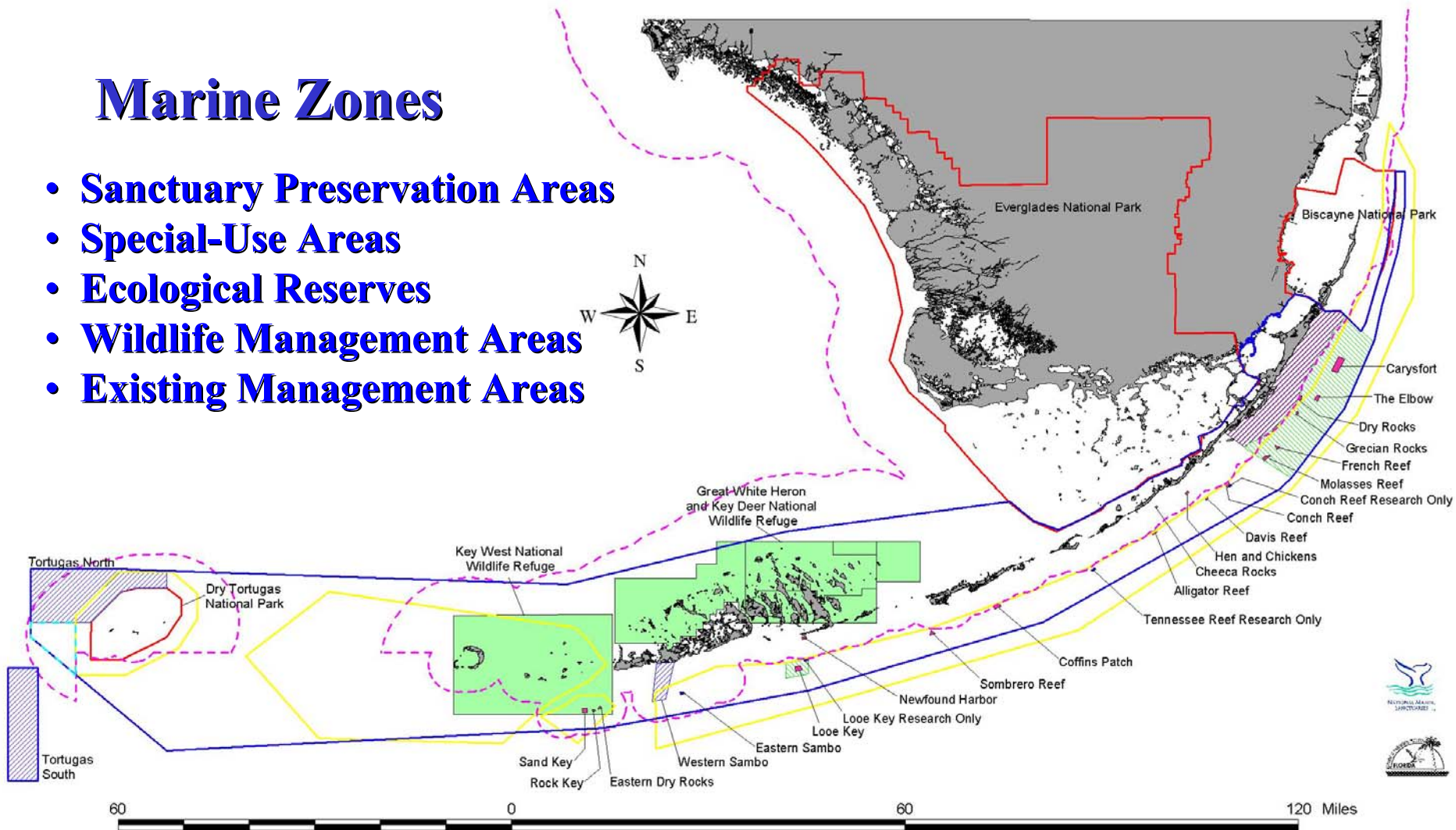




Florida Keys National Marine Sanctuary

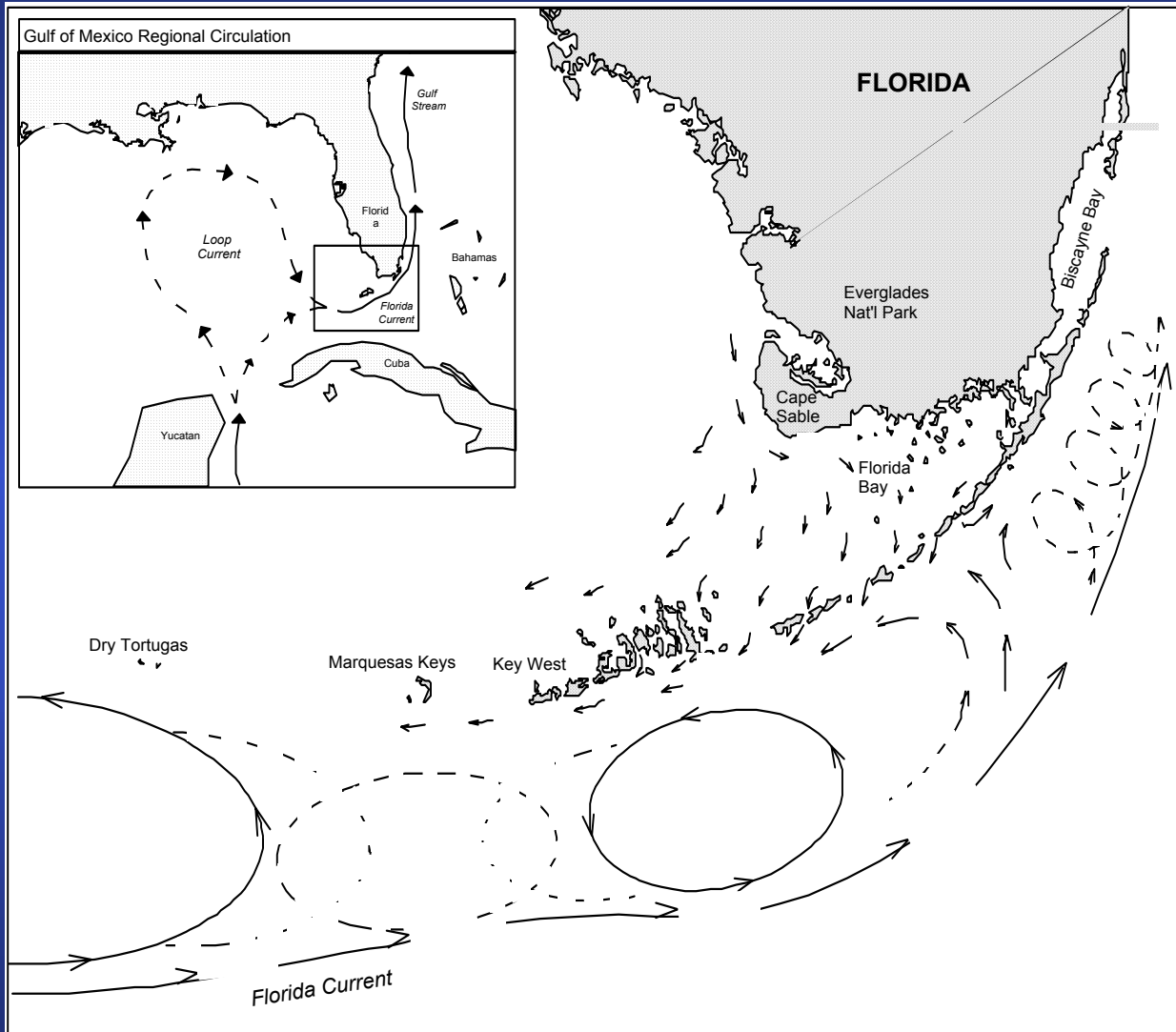
Marine Zones

- **Sanctuary Preservation Areas**
- **Special-Use Areas**
- **Ecological Reserves**
- **Wildlife Management Areas**
- **Existing Management Areas**

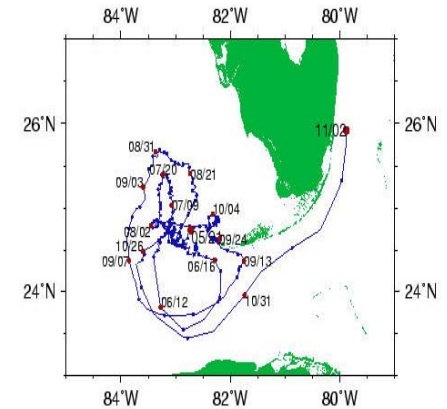


Oceanography / Currents

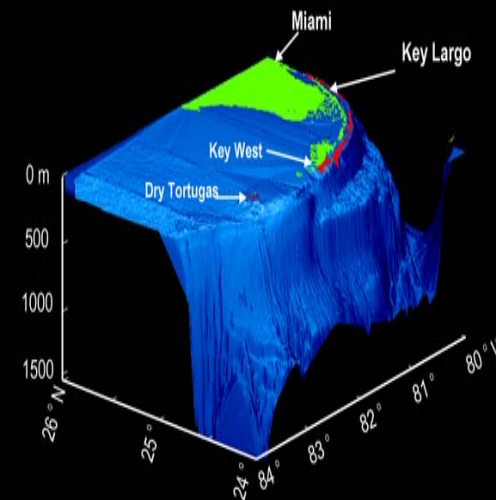
High potential for providing larvae to downstream areas



Current Meters



Bathymetry



High potential for receiving & retaining larvae

Wildlife Management Areas

- 27 WMAs (19 with USFWS)
- Include bird nesting, resting, or feeding areas, turtle nesting beaches, and other sensitive habitats
- Vary in size and location
- Protect endangered or threatened species or their habitats
- Provide opportunities for public use / reduces conflicts
- Mode of Access Managed





Existing Management Areas

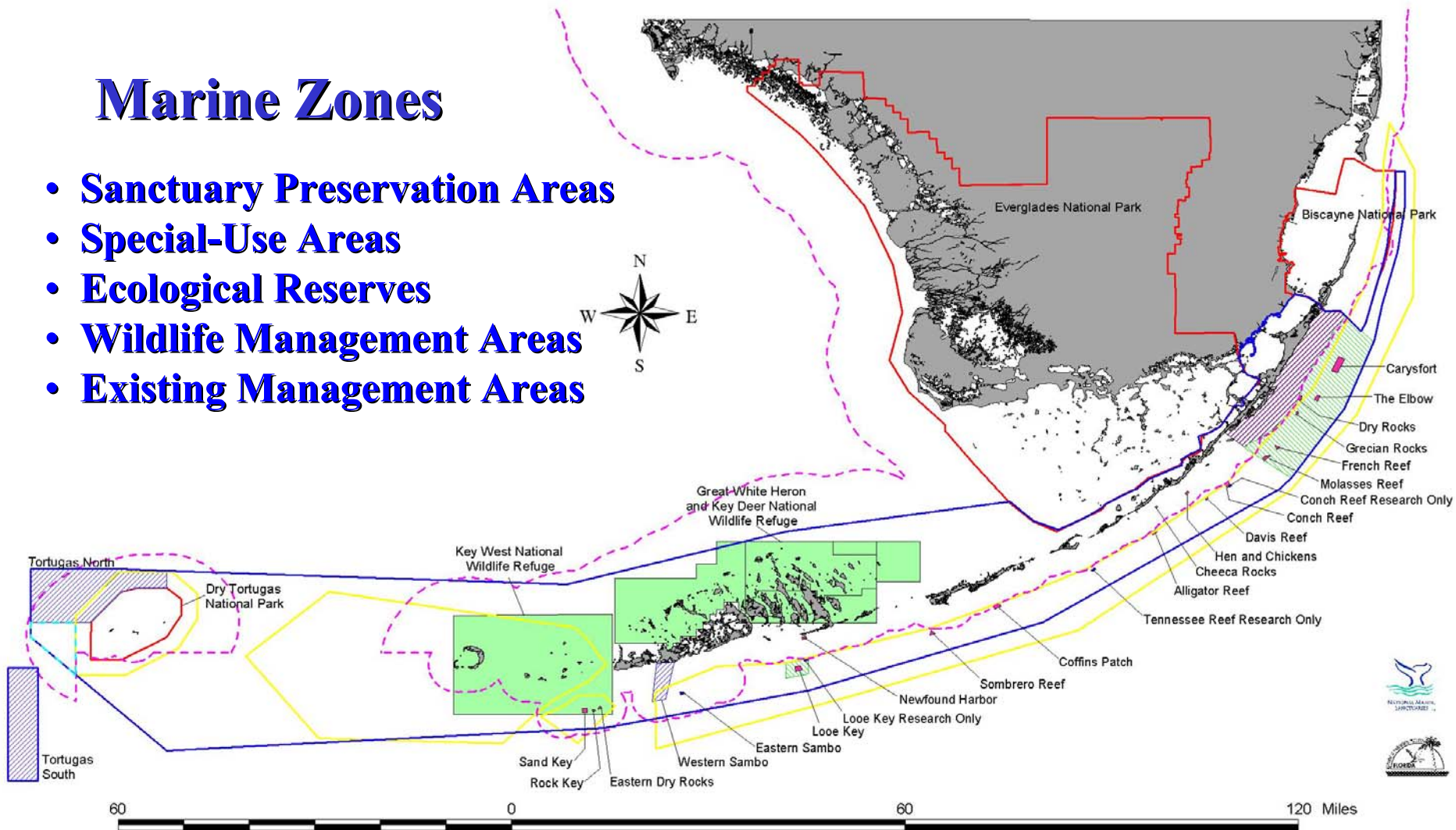
- 19 Existing Management Areas
- Areas of local, state or federal jurisdiction
- 6 Federal Areas
 - 2 previous NMSs
 - 4 USFWS Refuges
- 13 State/local jurisdictions
 - 6 State Parks
 - 3 Aquatic Preserves
- Regulations not affected by Sanctuary
- Sanctuary Regulations Enhance existing regulations in many instances



Florida Keys National Marine Sanctuary

Marine Zones

- **Sanctuary Preservation Areas**
- **Special-Use Areas**
- **Ecological Reserves**
- **Wildlife Management Areas**
- **Existing Management Areas**



Sanctuary Advisory Council

- **Monroe County Elected Official**
- **Citizen Reps.**
- **Recreation Fishing Reps.**
- **Commercial Fishing Reps.**
- **Tropical Fishing Collector**
- **Archaeology rep**
- **Dive Industry Reps.**
- **Science Rep.**
- **Conservation Organization Reps.**
- **Education Rep.**
- **Tourism reps**

19
Members of
various
stakeholders

Tortugas 2000 Working Group

- 25 member Working Group of Sanctuary Advisory Council
- All stakeholders
- All Resource Managers
- Ecosystem Approach
- Ignored Jurisdictions
- Focus not on size or % area, but objectives



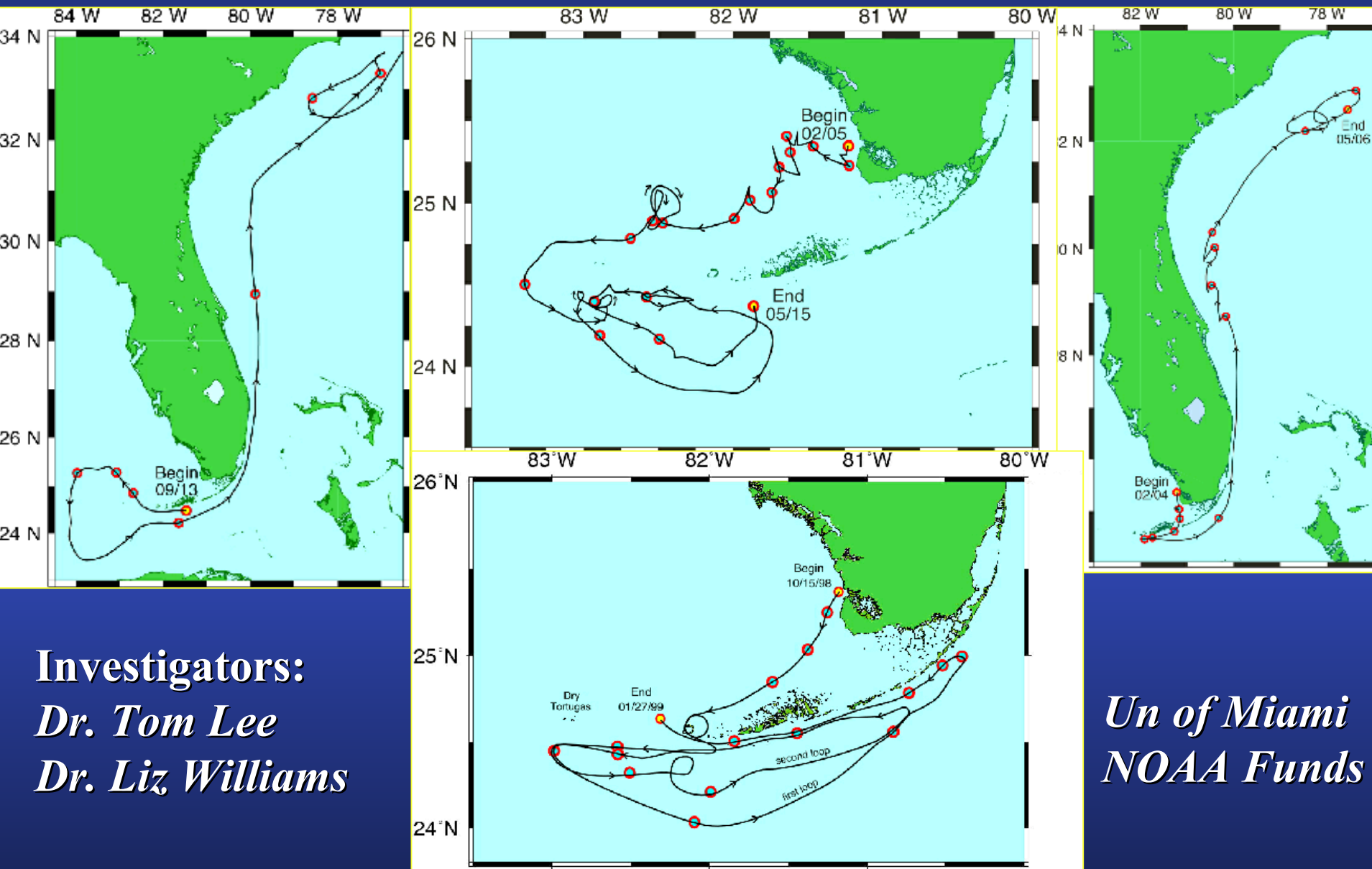
Tortugas 2000 Working Group

Heard Presentations from:

- *Oceanographers*
- *Geologists*
- *Coral Reef Ecologists*
- *Fisheries Biologists*
- *Fishermen / Divers*



Four Paths of Satellite Current-Tracking Meters

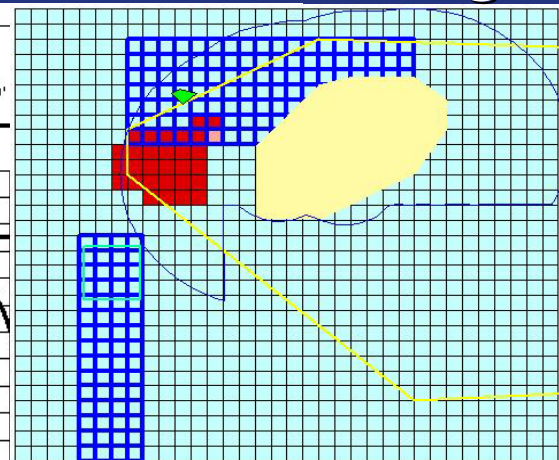
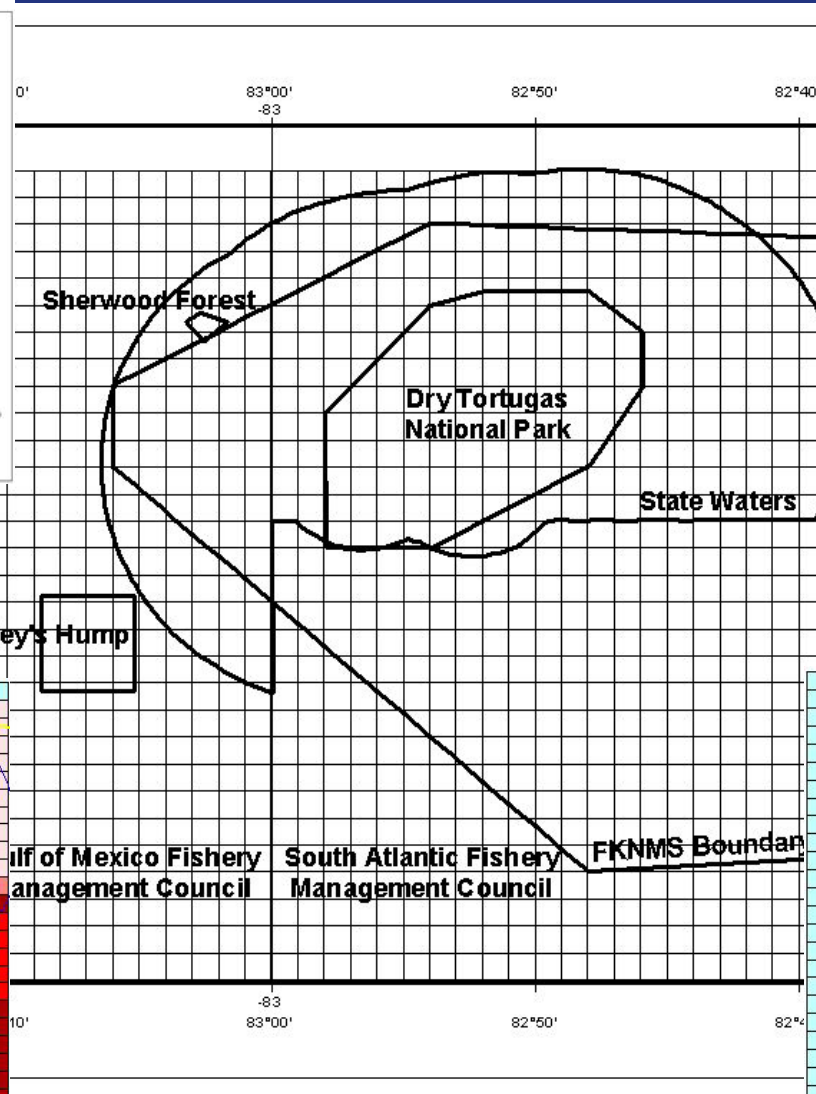
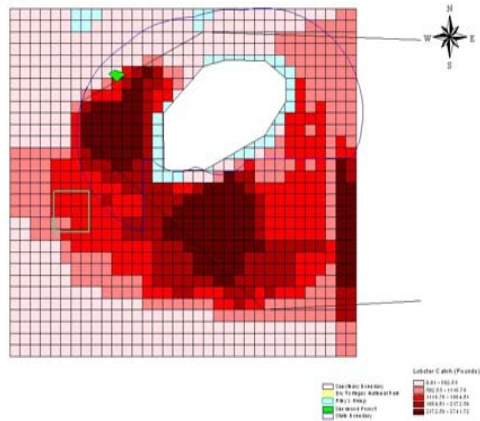


Socio-economic Assessment

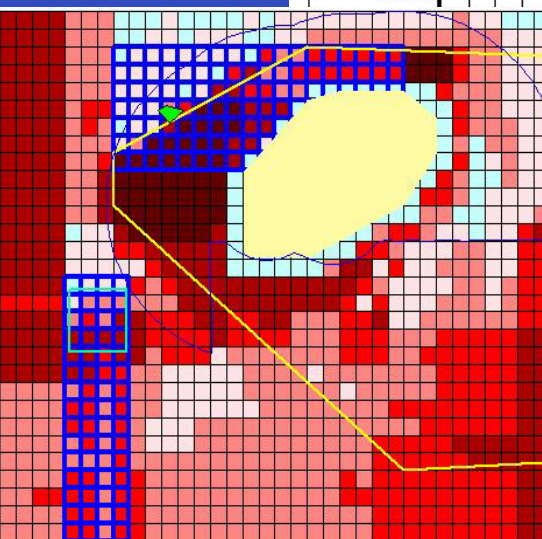
Lobster

Diving

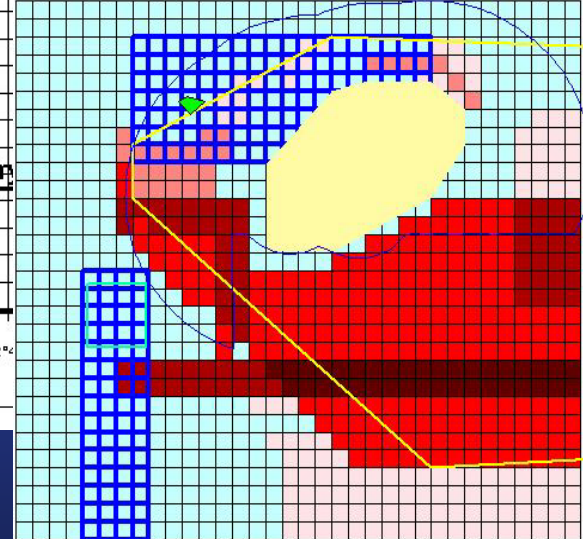
Lobster Catch



Reef Fish



Rec Fish



OPINION

Congratulations to all **Consensus a welcome relief**

The fuse was lit, but there was no explosion. That was the result Saturday when conservationists, fishermen and federal regulators met to discuss resource-user limits regarding the Tortugas Reserve. There was no expected explosion of venomous accusations back and forth, nor shouting. Instead, they hacked out a proposal that all sides felt they could live with.

We congratulate all sides for their efforts.

To anyone who has followed the rancorous "debates" over the years between these factions in regards to the Florida Keys National Marine Sanctuary, Saturday's consen-

EDITORIAL

sus was a welcome relief. For too long, since April 1998 in fact, the only thing raised was the blood pressure of those participating.

What the group, formally called the Tortugas 2000 Working Group, did was to carve out approximately 186 square nautical miles of the waters of the Dry Tortugas National Park and the Gulf of Mexico as part of a proposed Tortugas Ecological Reserve. The area includes a portion of the northwestern Tortugas and another part southwest of the Tortugas, to

include a spot known as Riley's Hump.

The purpose of the proposal is to set aside parts of potential spawning areas in the area 70 miles west of Key West in the hopes that fish, lobster and other marine life can develop safely outside the areas harvested by commercial fishermen.

There will still be many steps to take before the proposal will be finalized. The next step will be to present the agreement to the Sanctuary Advisory Council on June 15.

But for now, we congratulate all factions of the advisory group for their ability to compromise

Wednesday, April 25, 2001

F L O R I D A K E Y S

44 PAGES

25 CENTS

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MIDWEEK

Bush OKs Tortugas protection

By KEVIN WADLOW
Senior Staff Writer
kwadlow@keynoter.com

The largest fully protected marine preserves in U.S. waters become a reality in the Dry Tortugas in July.

Urged on by elementary students and a disparate coalition of supporters, the state Cabinet spoke

Governor, Cabinet sign off on plan to create the United States' largest no-fishing zone

▼ MARINE RESOURCES

with a unanimous voice in approving the Tortugas Ecological Reserves.

The decision at Tuesday's

Cabinet meeting in Tallahassee was the last step for the 151 square miles of no-take reserves, with enforcement expected to begin in July at the most heavily visited sites.

"The Florida Keys and the Dry

Tortugas are one of the 200 most important landscapes and seascapes on the planet," said Kathryn Fuller, president of the World Wildlife Fund. "It's highly important to set a significant portion of this environment aside for preservation."

Fourteen fifth- and sixth-grade students from Stanley Switlik

Designing Marine Zones

Summary:

- **Involve stakeholder leadership in process**
- **Integrate the best available natural and socioeconomic science into the process**
- **Utilize a process that is precise and science driven, but incorporates the best available anecdotal information when necessary**
- **Overcome perceptions of social and economic injustices by incorporating socioeconomic data**

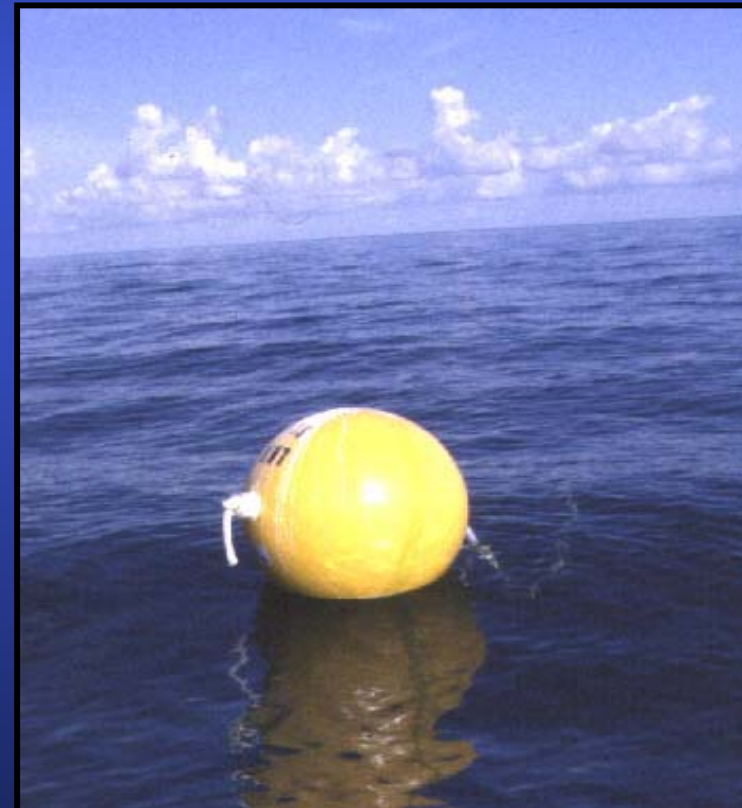
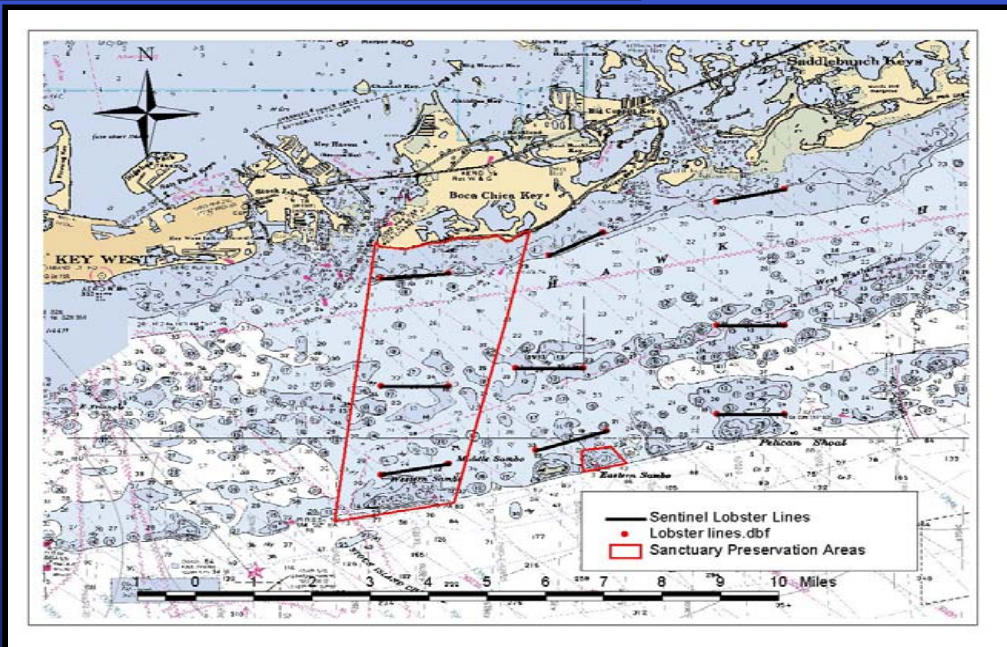
Zoning Implementation

Success Requires:

- **Boundary Marking - Buoys / Charts**
- **Education**
- **Monitoring and Research**
- **Enforcement**

Mark Boundaries

- Buoys
- Charts
- GPS Units



EDUCATION



Team OCEAN

Literature Distribution



450 Keys Businesses

- ☞ Hotels/Motels
- ☞ Marinas
- ☞ Chambers of Commerce
- ☞ Dive Shops
- ☞ Bait and Tackle Shops
- ☞ Parks
- ☞ Realtors
- ☞ Rental Boat
- ☞ Airports

THE FLORIDA KEYS NATIONAL MARINE SANCTUARY:



Zone Monitoring and Research

Zone Monitoring Program Goals

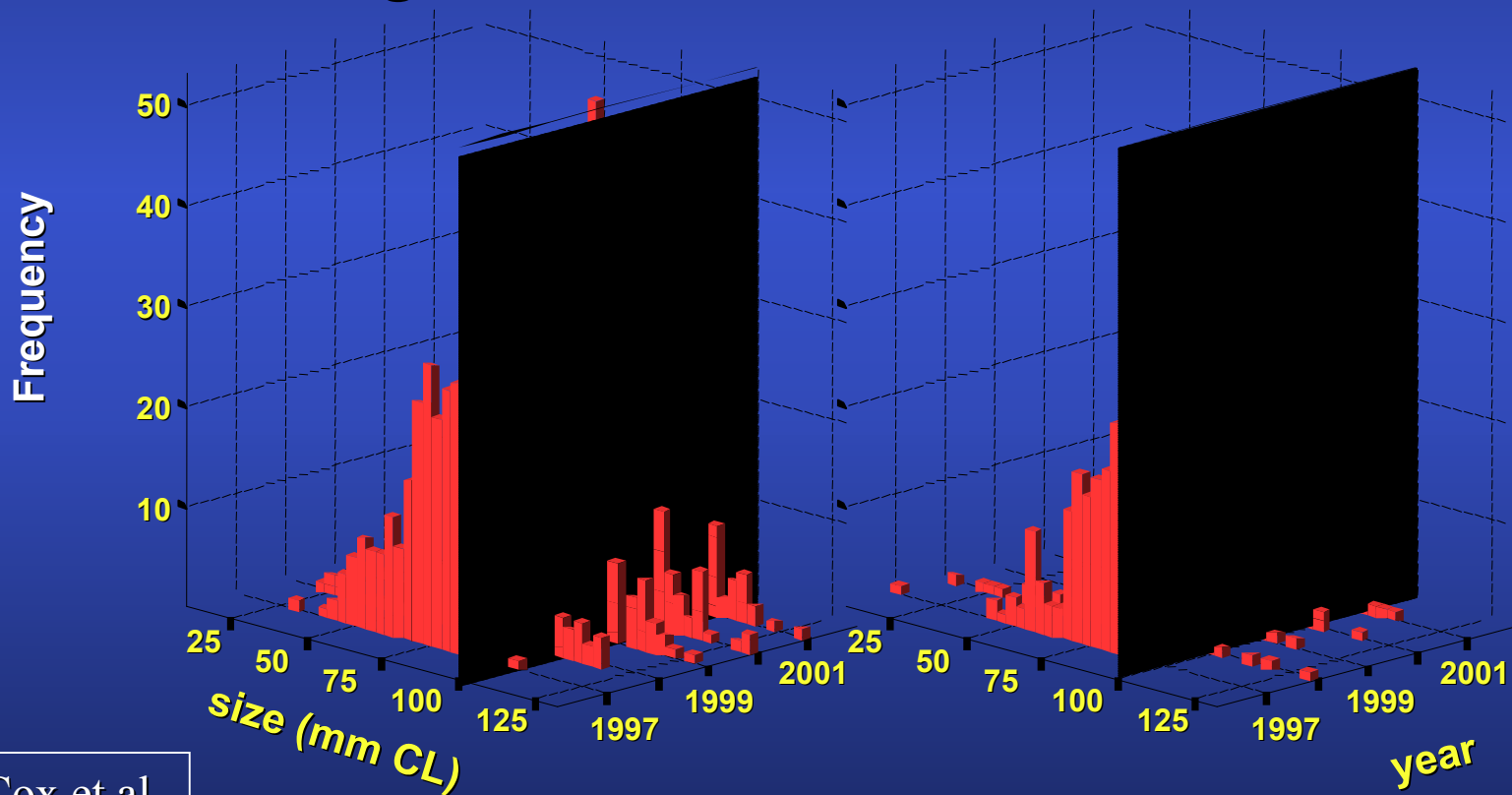
- Measure benthic and fish community changes inside and outside fully protected marine zones
- Evaluate the effectiveness of “no-take” management for protecting marine biodiversity
- Determine the socioeconomic effect of and user attitudes towards the zones



Size-Frequency of Male Spiny Lobsters

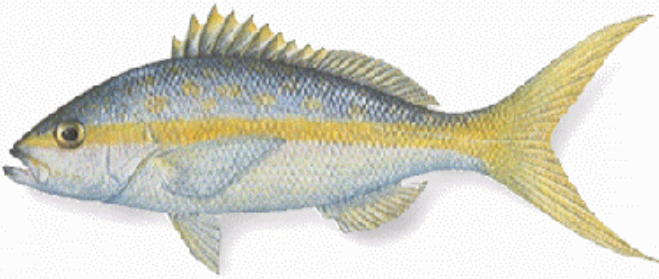
Western Sambo
Ecological Reserve

Pelican Shoal
Reference



Cox et al.

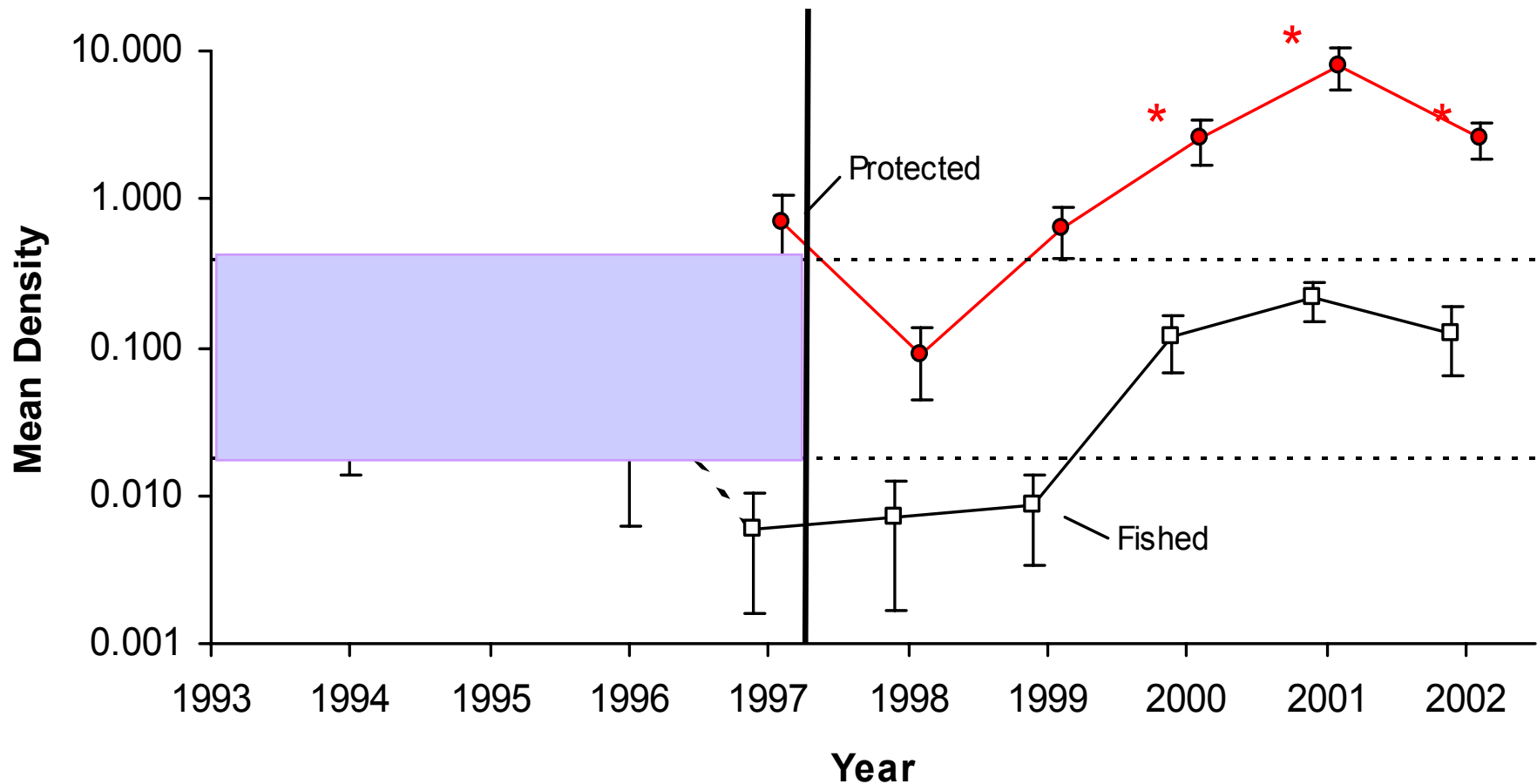




Reef Fishes

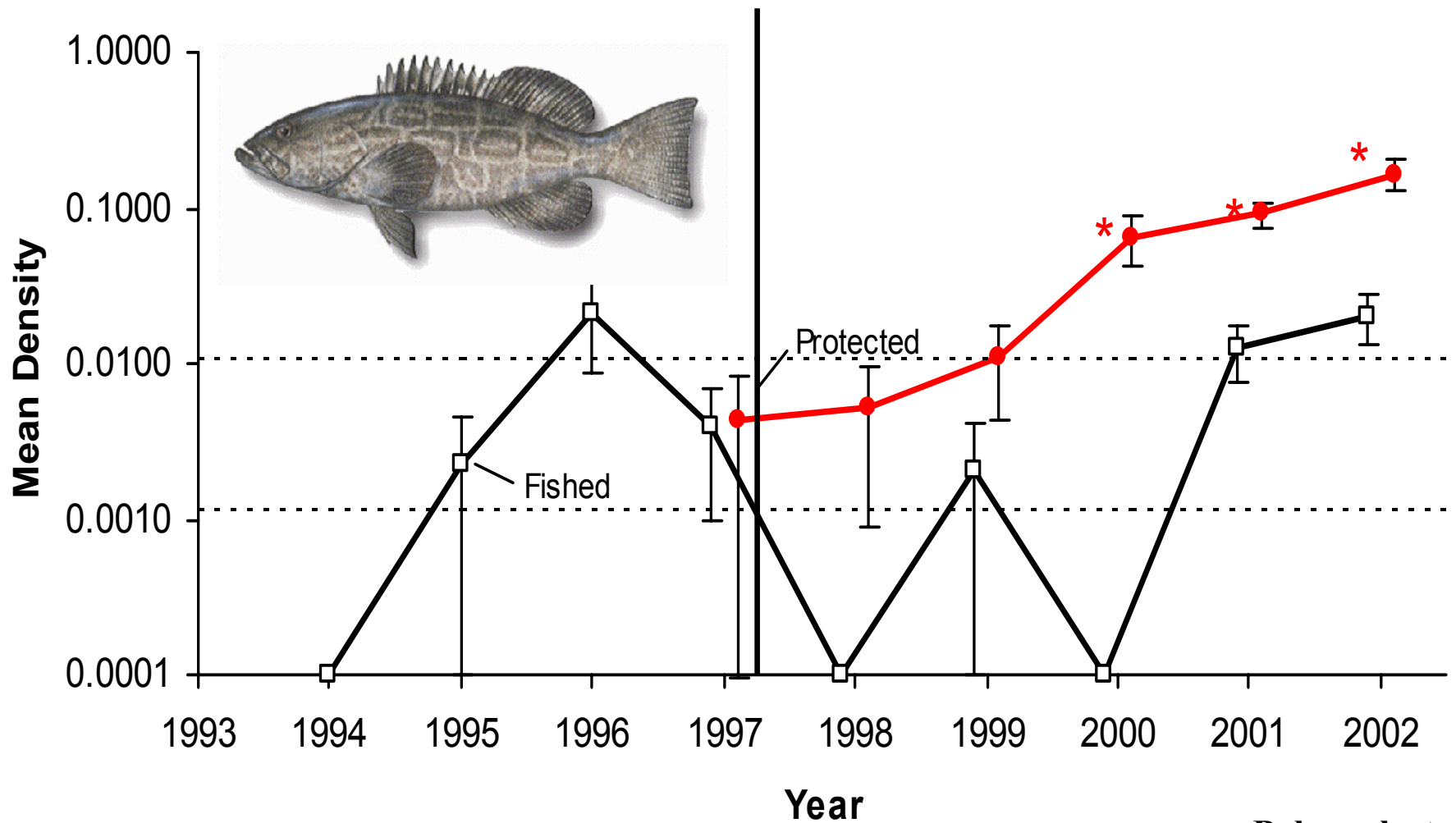


Yellowtail Snapper, Exploited Phase



Bohnsack et al.

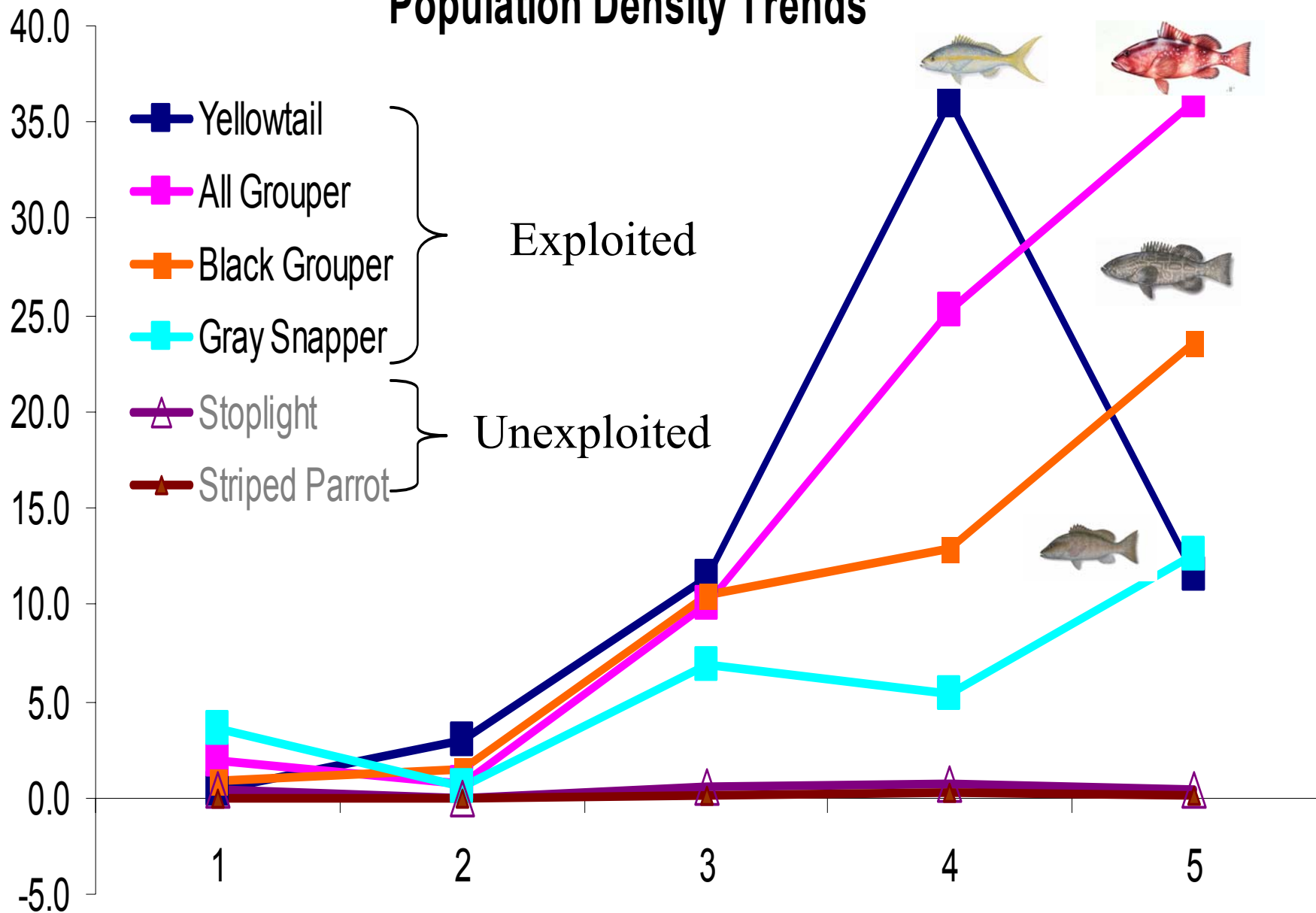
Black Grouper, Exploited Phase



Bohnsack et al.

Population Density Trends

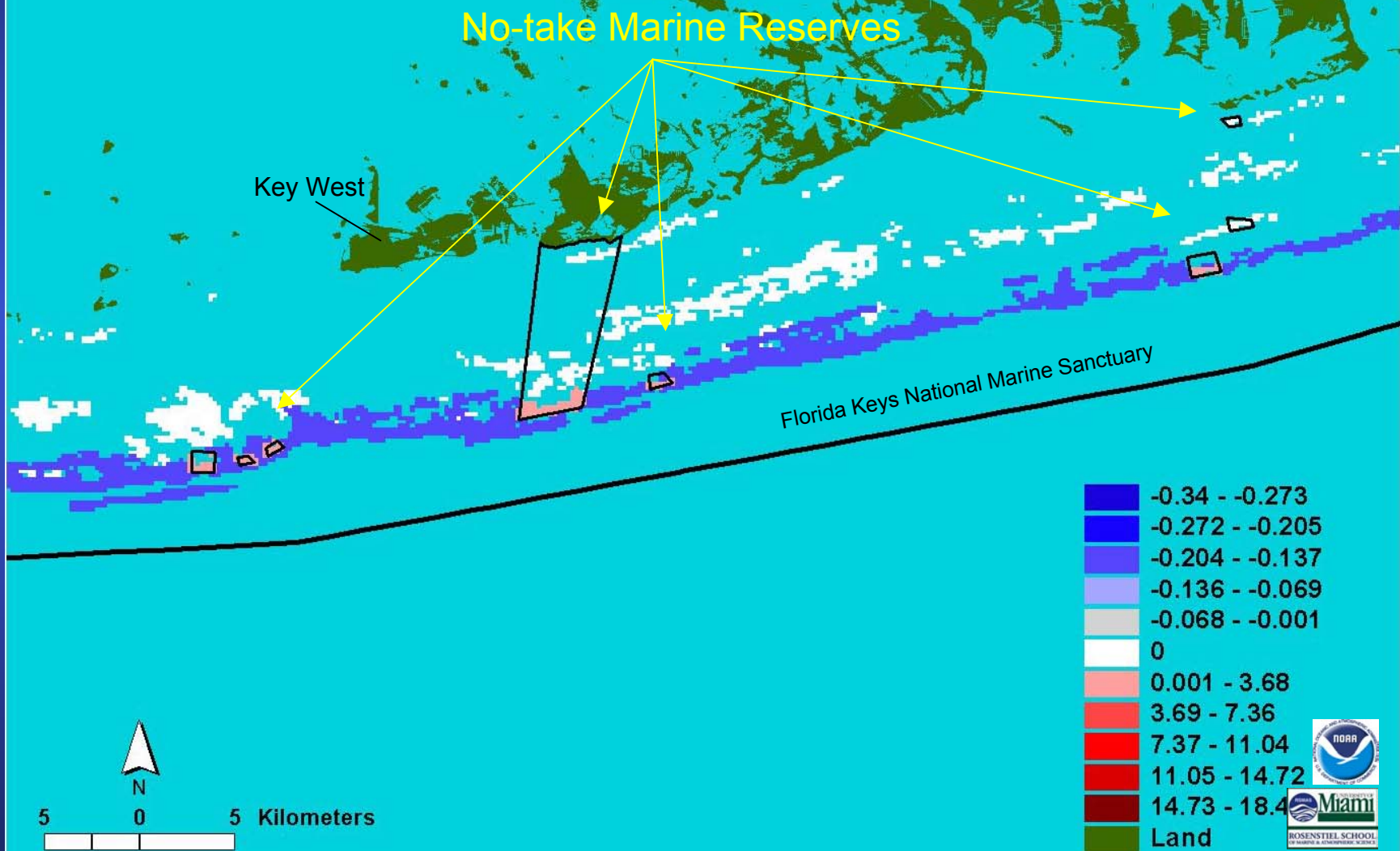
Population Change Factor



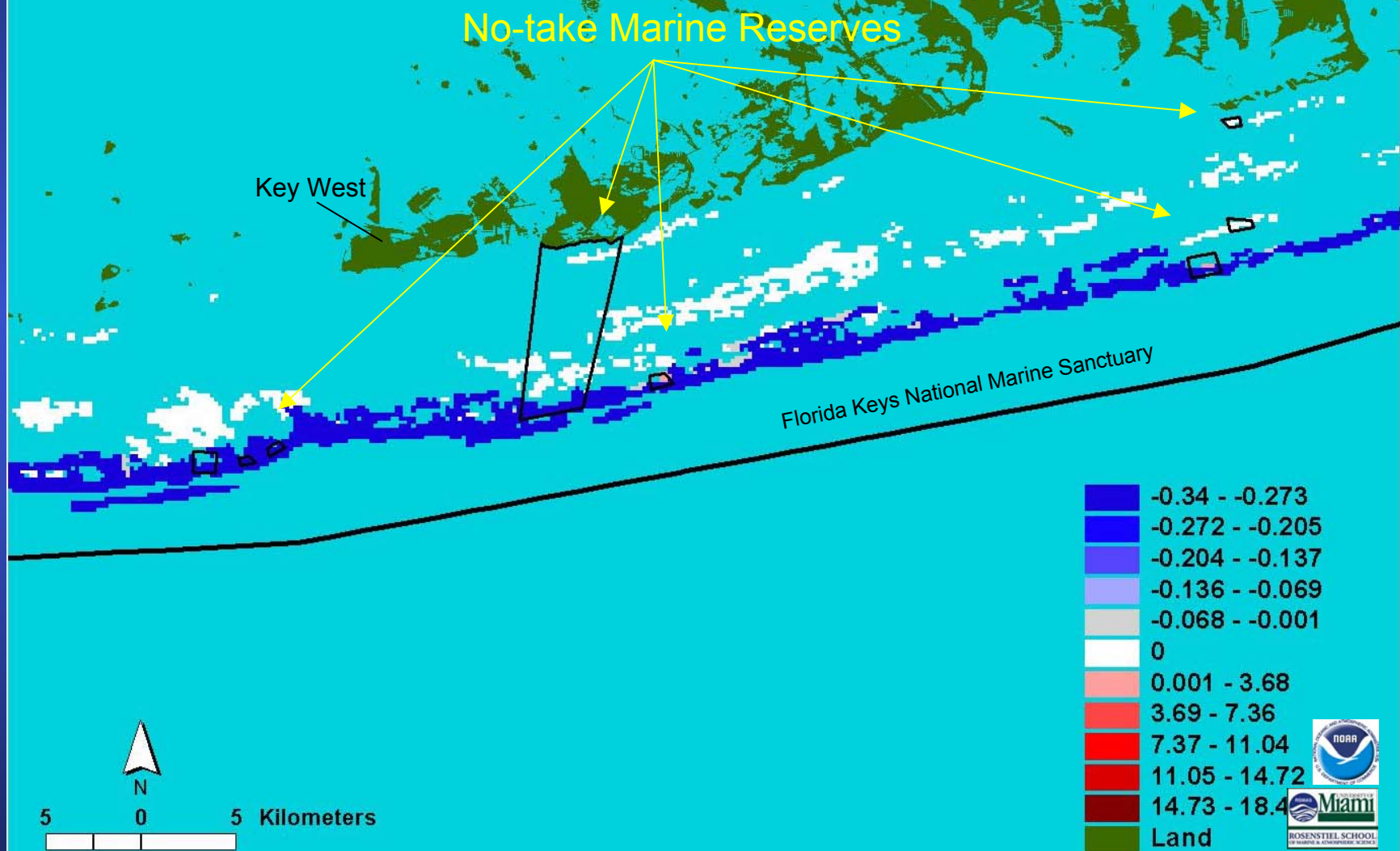
Years After Protection

Bohnsack et al.

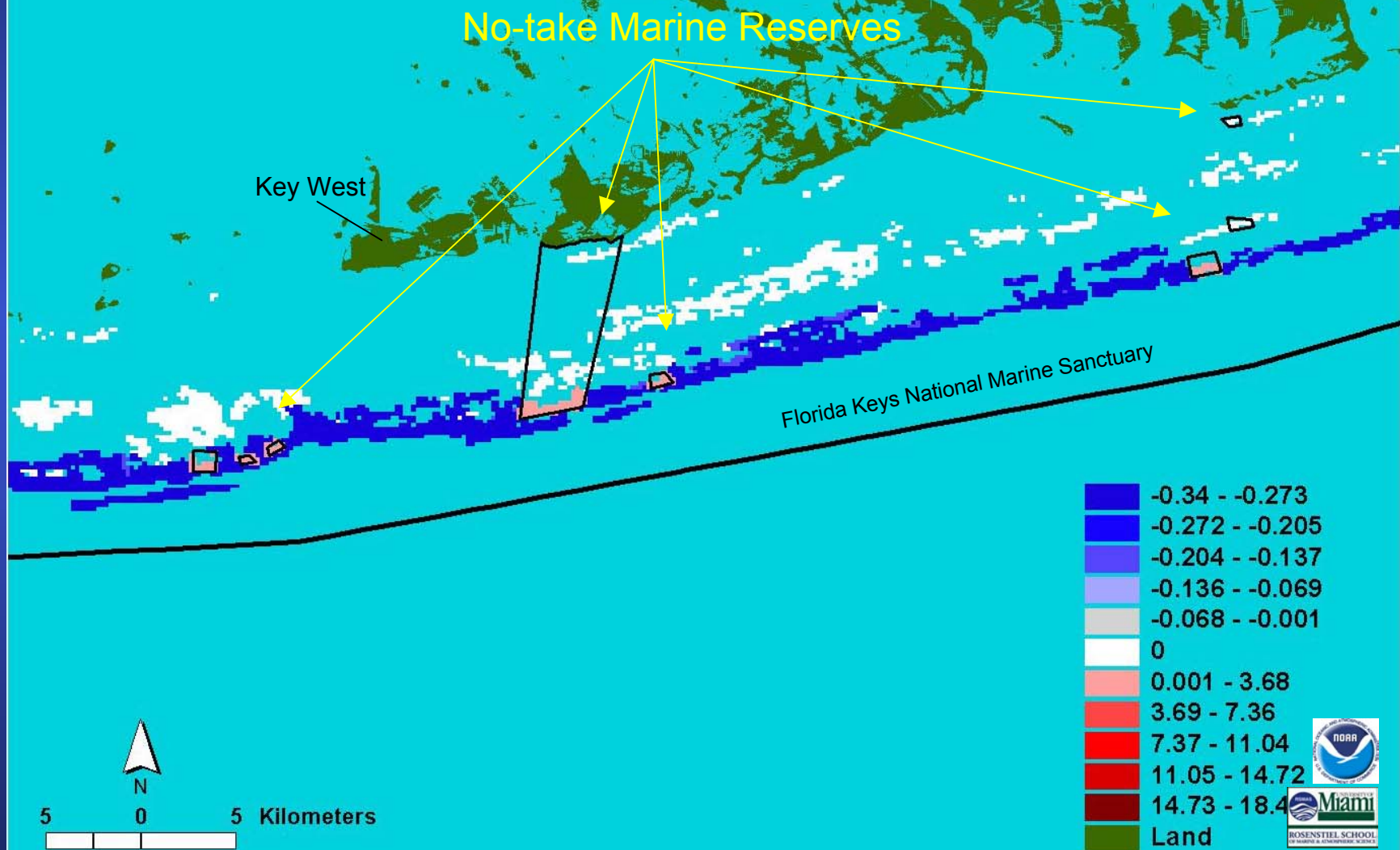
1997 Yellowtail Snapper Density (Adults)



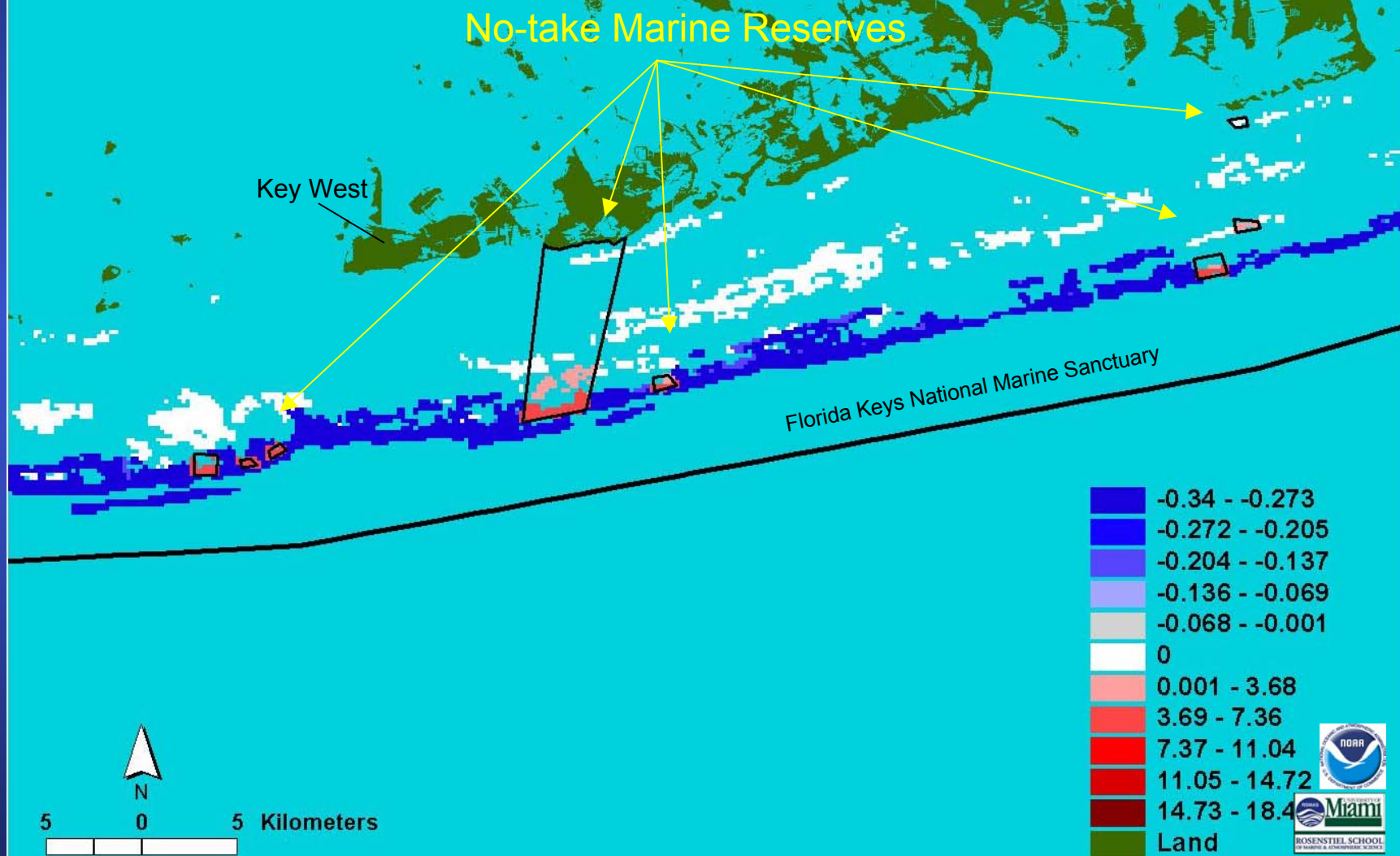
1998 Yellowtail Snapper Density (Adults)



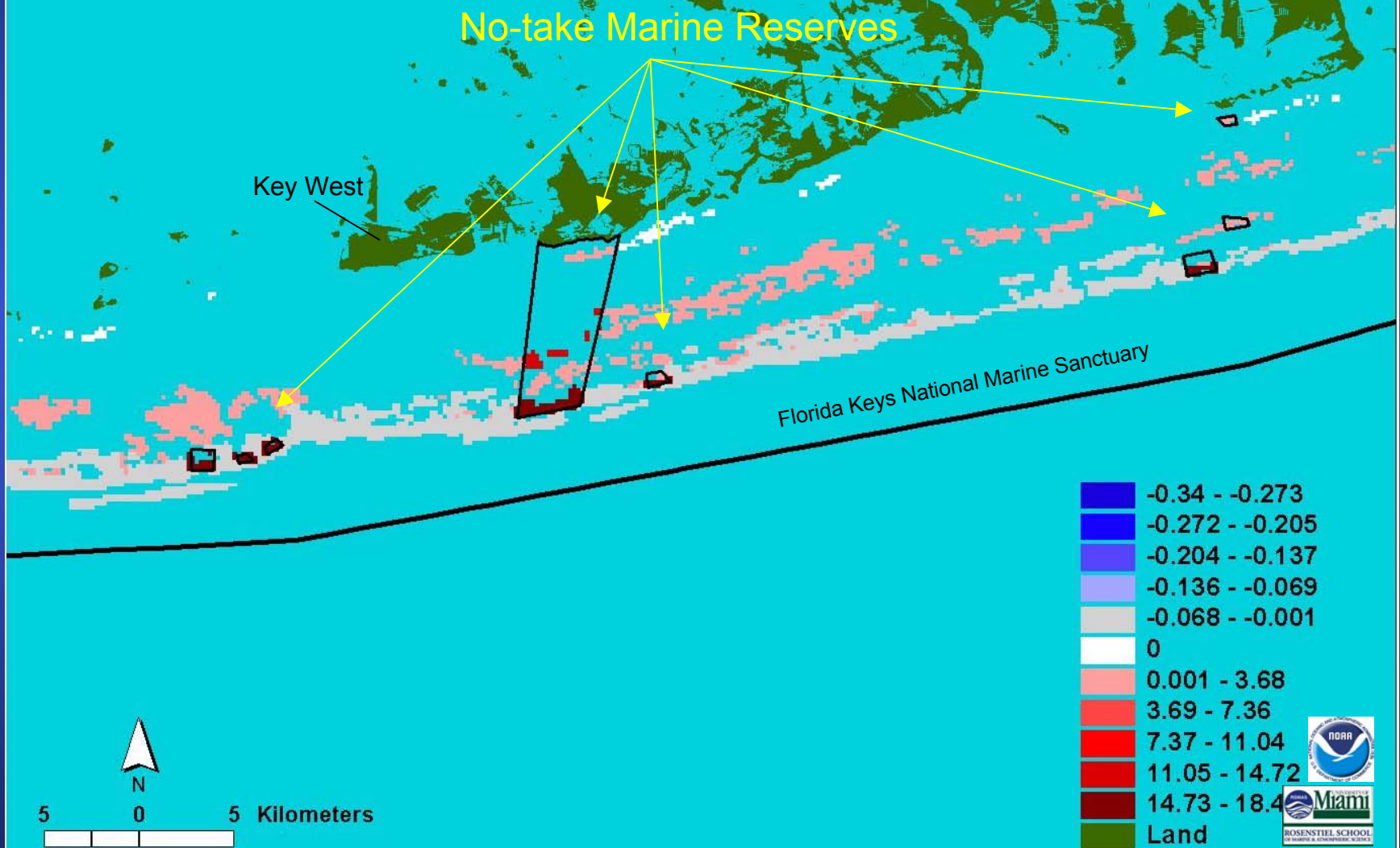
1999 Yellowtail Snapper Density (Adults)



2000 Yellowtail Snapper Density (Adults)



2001 Yellowtail Snapper Density (Adults)



Sanctuary Law Enforcement

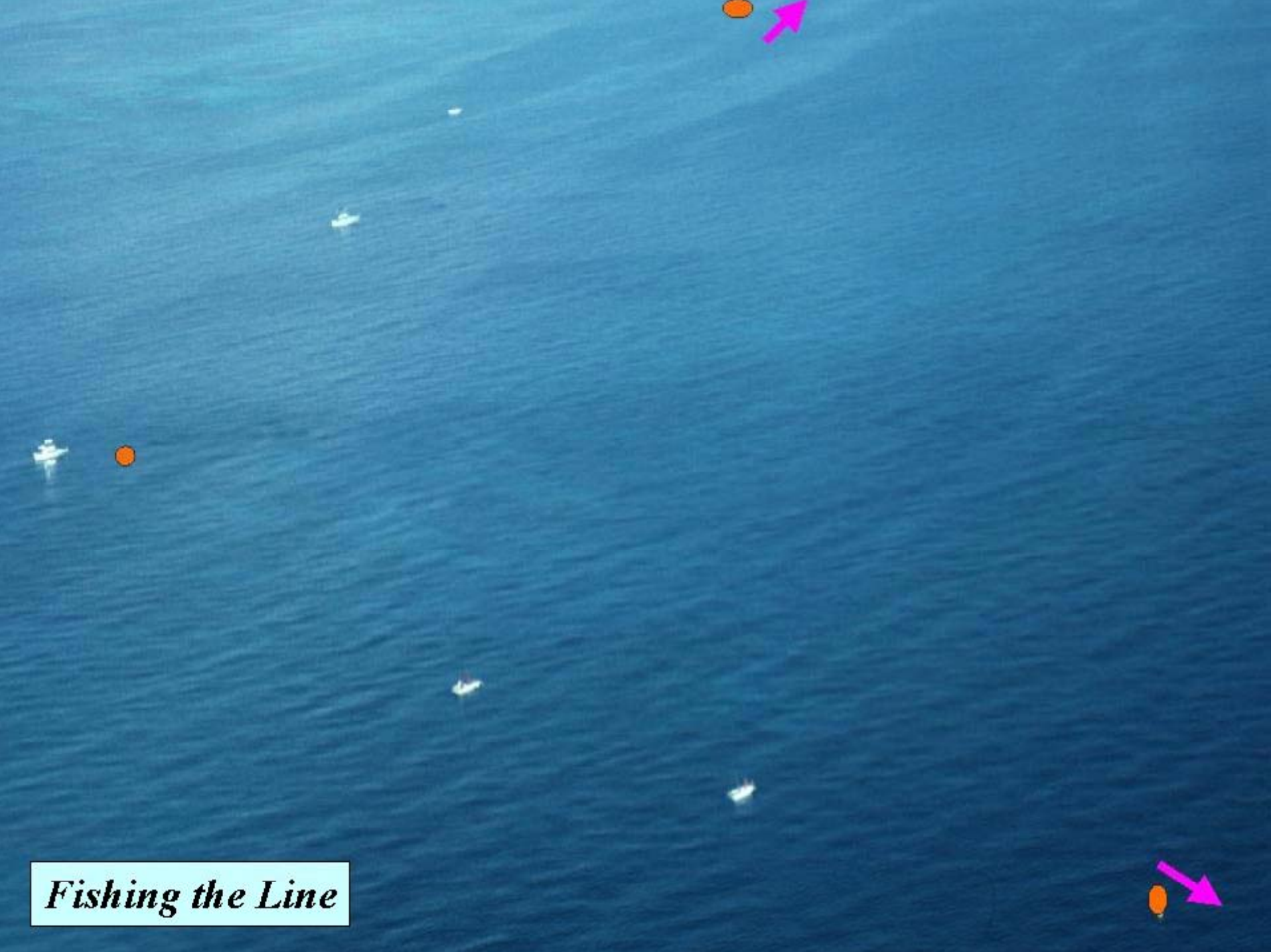
- Sanctuary Enforcement is a Partnership Between NOAA and the State of Florida
- The Florida Fish and Wildlife Conservation Commission and NOAA entered into Memorandum of Agreement



Sanctuary Enforcement

- ◆ Use Interpretive Enforcement
- ◆ Federally Funded
 - ◆ State FWC Officers
 - ◆ Equipment
- ◆ 17 Sanctuary Officers
- ◆ Captain & 4 Lieutenants
- ◆ NOAA / Enforcement





Fishing the Line

Something to think about:

“ It is important to scientific study and to the health and sanity of man, that there be preserved some unique areas to observe nature’s continuing evolution; the grandeur and peace of nature.”

Samuel H. Ordway, Jr.

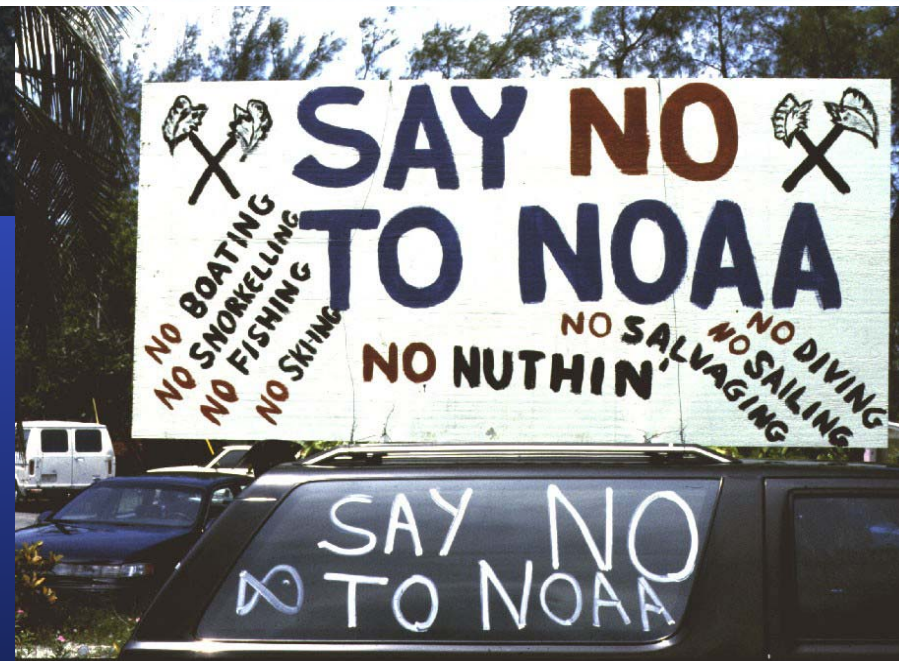


NATIONAL MARINE
SANCTUARIES TM



Marine Zoning

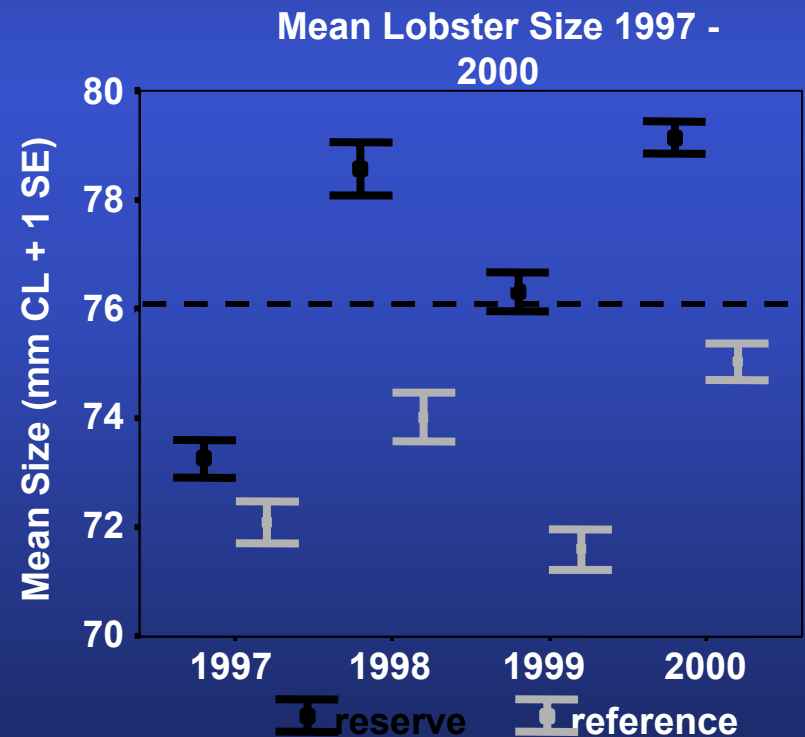
- *Controversial*
- *Process Flawed*



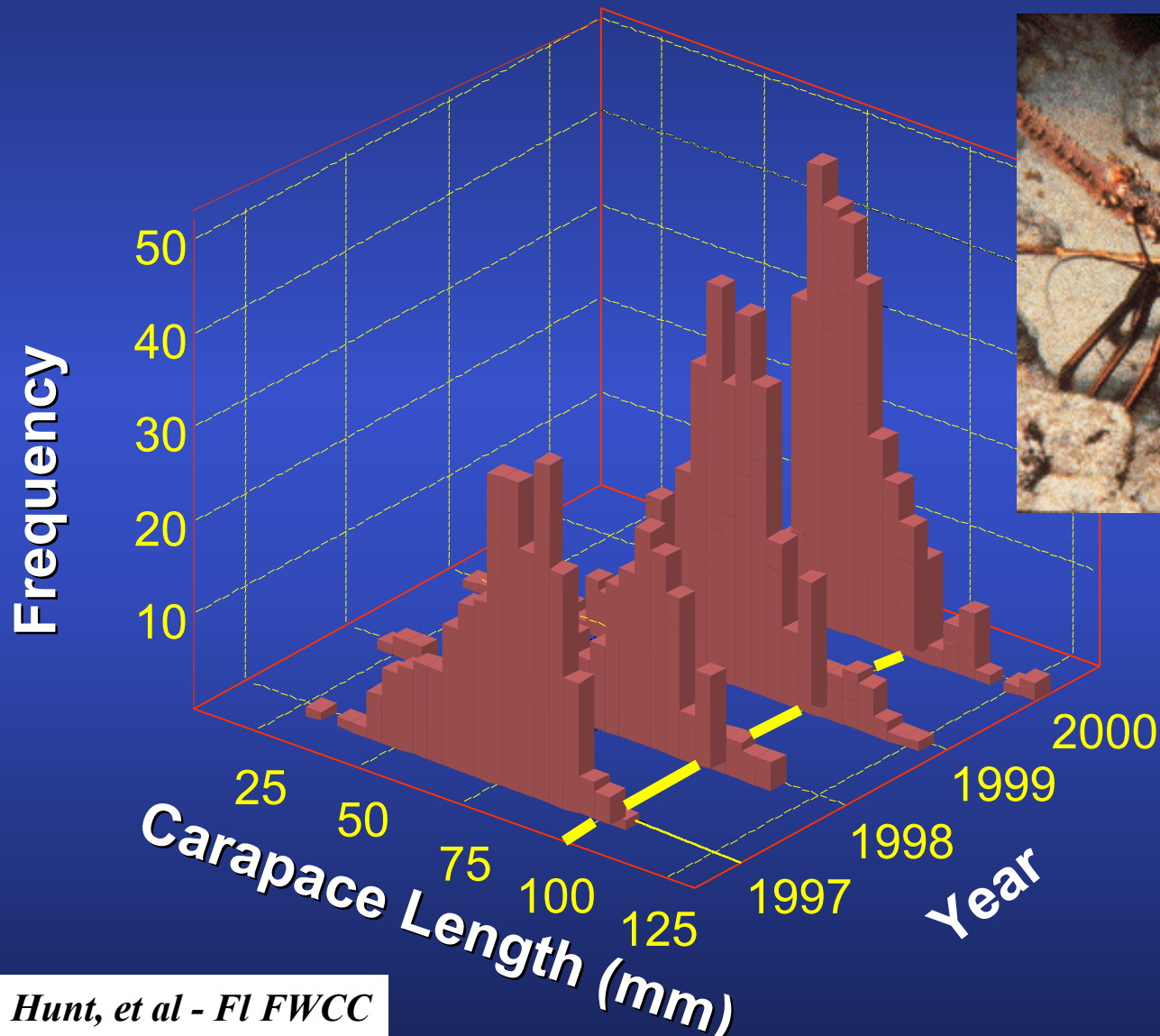
Year 3 Zone Performance Results

SPINY LOBSTER

- More lobsters in fully protected zones during both open and closed lobster season
- Mean size of lobsters larger in fully protected zones during both open and closed lobster season
- CPUE higher in Western Sambo Ecological Reserve in both open and closed season
- No conclusive spillover effects detected based on size or CPUE



Spiny Lobster: Male Size Inside Western Sambo Ecol. Reserve

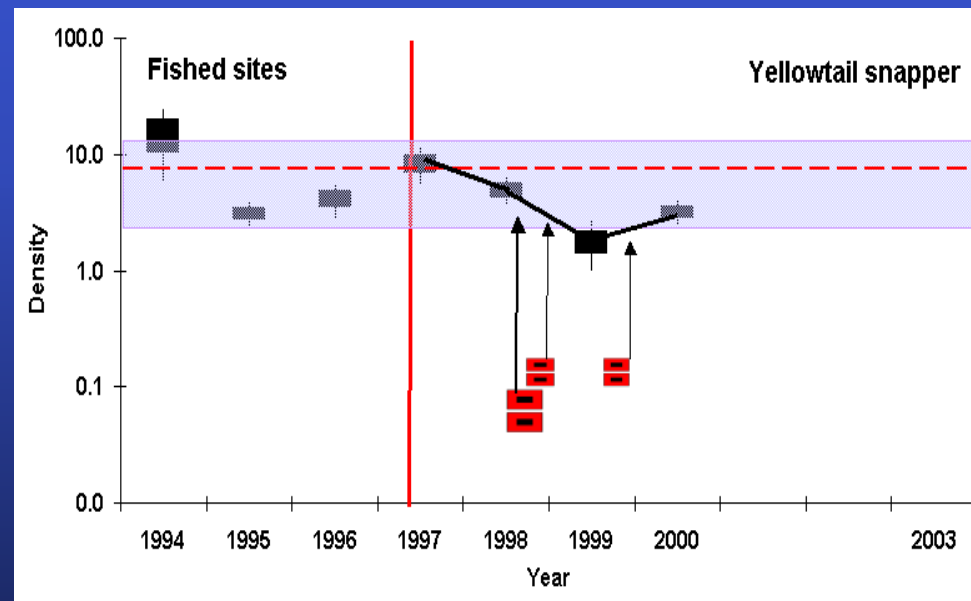
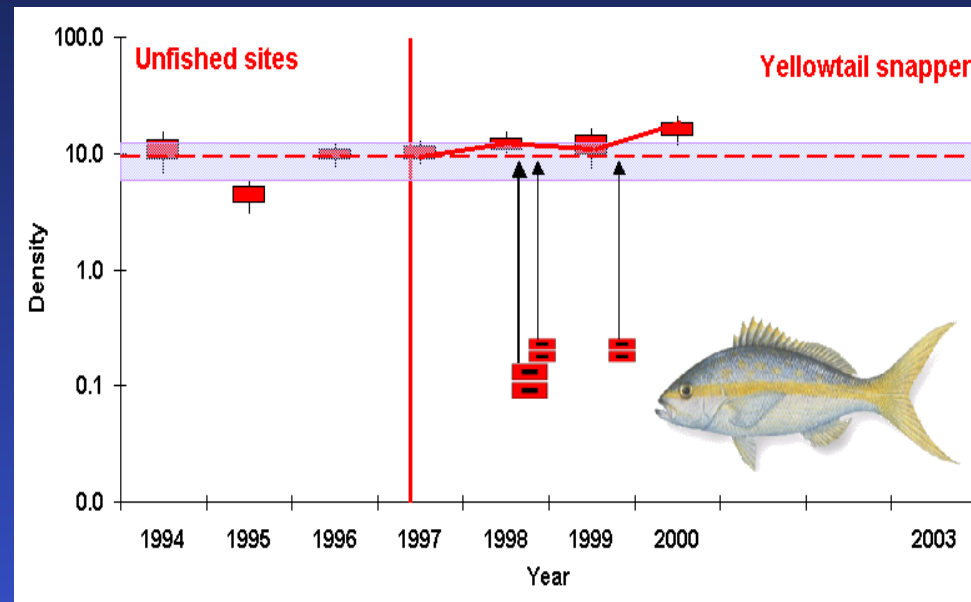


Enforcement

- Obtained two 82' USCG cutters for patrols
- Obtained two 41' USCG patrol craft



Reef Fishes 1



Source: Bohnsack & Ault